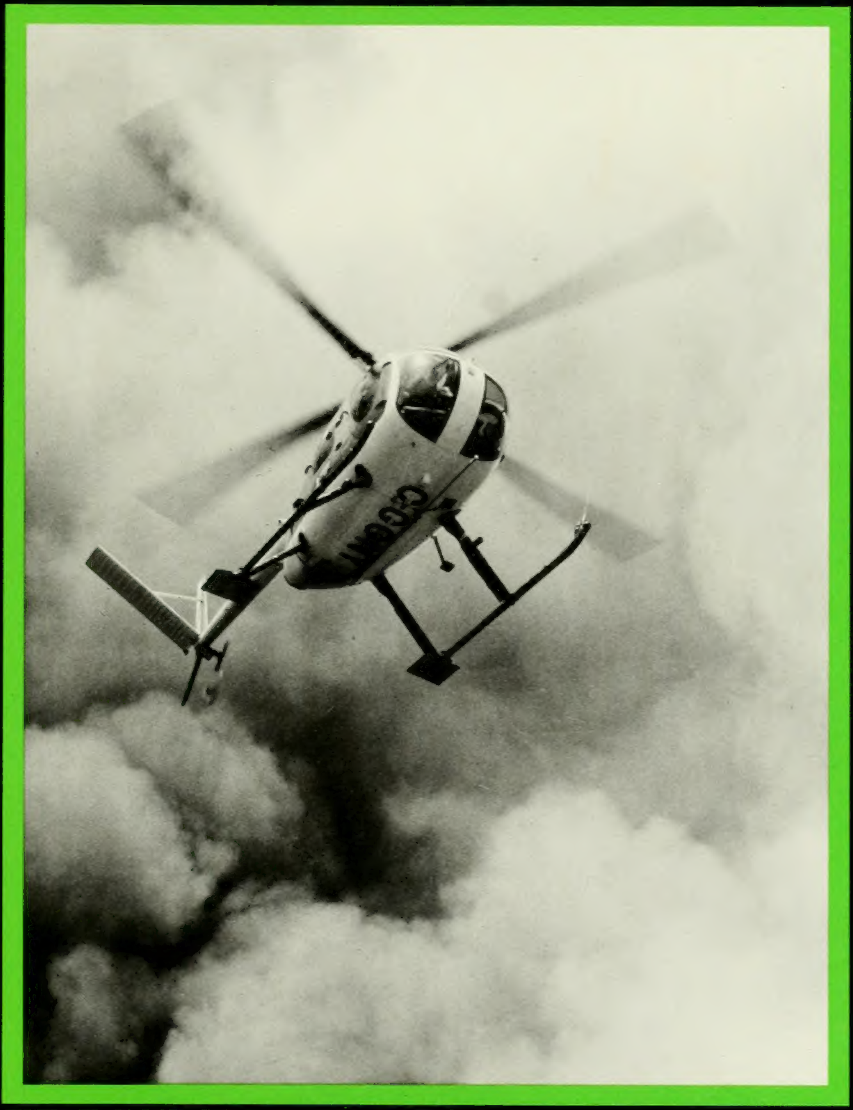
Ontario

Annual Report 1981 Minister of Natural Resource

A
5
5



A
5
5

Fiscal year ending March 31, 1981

Annual Report of the Minister of Natural Resources of the Province of Ontario

TO HIS HONOUR
The Lieutenant-Governor
of the Province of Ontario

MAY IT PLEASE YOUR HONOUR
The undersigned begs respectfully to present to your Honour the Annual Report of the Ministry of Natural Resources for the fiscal year beginning April 1, 1980, and ending March 31, 1981

Alan W. Pope
Minister

Ontario
Ministry of
Natural
Resources

$2.00

Contents

Minister's Message 4

Deputy Minister's Message 5

Aviation and Fire Management 7

Forest Resources Management 11

Mineral Resources Management 19

Lands and Waters Management 27

Outdoor Recreation Management 35

- Parks and Recreational Areas 35
- Wildlife 39
- Fisheries 45

Administration 51

Statements of Revenue and Expenditure 55

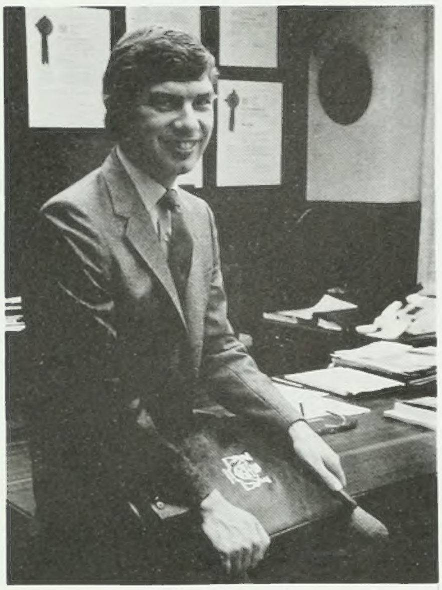
Organization Charts 58

Ministry Agencies 60

Front Cover: Helicopters play a major role in initial attack on forest fires—ferrying crews and supplies into position on fire lines. In 1980, 93 extra helicopters were pressed into service to fight the worst of the 1,779 fires in the province.

All photographs taken by Ministry staff.

Minister's Message



In April, 1981, I was honored to be appointed as Ontario's Minister of Natural Resources. I view the Ministry of Natural Resources as an exciting challenge because of the breadth of the Ministry's mandate and the vital importance of natural resources to the economic and social well-being of the people of Ontario.

To ensure that Ontario residents receive the greatest continuous benefit from their natural resources, the Ministry takes an integrated approach to resource management. Different combinations of uses of the various natural resources in a given geographical area are evaluated; the option which produces the most overall benefits is adopted.

The Ministry applies this management strategy directly to Crown lands, where it has administrative responsibility, and encourages municipalities and private land-owners to apply it to privately owned land.

Benefits from the use of the province's natural resources are many. Examples for the fiscal year ending March 31, 1981 include:

- The value of shipments from forest-related industries was just in excess of $6.0 billion; exports were $2.0 billion and employment 78,000 jobs.
- The total value of mineral production in Ontario was $4.68 billion, and mining tax revenues reached a record high of $160.5 million.
- 3.2 million nights of camping and 5.5 million days of outdoor recreation occurred in our provincial parks; while 4.5 million days of hunting, 35.4 million days of fishing were enjoyed throughout the province.
- Expenditures by anglers were estimated to be $414 million, while over $230 million in gross sales, $132 million in income and 5,200 associated jobs were created by the Provincial Parks program and by expenditures of visitors to the parks.
- The value of the commercial fish harvest was $23.6 million, while the value of wild fur pelts and wild rice was $24.4 million.
- The Province received a total of over $22 million from tax revenues under The Mining Tax Act, Crown timber revenues and water power rentals.
- 225 cottage lots on Crown land were either sold or leased.

In carrying out its widespread resource management responsibilities, the Ministry often faces conflicting demands from many competing interests.

I would like to reiterate that my Ministry is committed to providing information to and consulting with the public on all issues of concern. It is my hope that this approach will lead to both better policies and to a greater public understanding of how and why the eventual decisions are made.

Alan Pope

Alan W. Pope

Deputy Minister's Message

I hope you will welcome the changed look and style of our Annual Report for the fiscal year 1980-81. We made these changes so that we might communicate about our Ministry's program accomplishments in a more useful and interesting way to a broader audience.

As in any government ministry or agency, an annual report not only reflects the record of the organization for the year, but also describes what the people on our staff did to contribute to the economic and social well-being of the people of Ontario.

1980-81 was an unusual year in one aspect. The 1980 spring and summer was dominated by a severe forest fire situation in our Northwestern and North Central Regions. The outbreaks were so numerous and often so severe, normal MNR operations were disrupted across the province as Ministry staff from many locations were airlifted during the emergency to the program fire areas.

Thanks to the unrelenting efforts of the fire control people, and those who supported them, millions of dollars worth of property and resources were protected.

After the worst of the fire emergencies were over, our staff made special efforts to catch up on their normal work. So successful were they, that most of the Ministry production targets were eventually met.

I take what I think is pardonable pride in our Ministry people for their 1980-81 accomplishments. As always, our human resources and the energy and enthusiasm with which they carried out their responsibilities, were the key to our successful achievements.

During the last fiscal year, too, we improved Ministry services to the public in a number of ways. For example, prospectors' licences, staking maps and metal mining claim tags were made available in nine more districts and one regional office. Also, the season was extended in more provincial parks during fall 1980, because we introduced an honor system for registration, which worked well.

The Ministry also contributed significantly towards the government's goal of increased and more effective use of the private sector in our operations. Five Forest Management Agreements were signed, which assign silvicultural responsibilities to pulp and paper companies. This step will also bring together the harvesting and regeneration cycles so that our forests will be replenished more effectively for future generations.

Also towards working with the private sector, the Ministry developed a contracting guide to assist field managers in dealing with local contractors. And, moves were made towards getting private firms to get into tree seedling container production.

Finally, the Ministry of Natural Resources has a commitment to provide opportunities for outdoor recreation and resource development for the continuous social and economic benefit of the people of Ontario, and to administer, protect and conserve public lands and waters.

All in all, it is my hope that your reading of this report will enable you to understand better what the Ministry of Natural Resources does to fulfil this commitment to the people of Ontario.

W. T. Foster.

The Fires of '80: "A Superhuman Effort"

Aviation and Fire Management

Last year's forest fire season was one of the worst ever suffered in Ontario.

At the season's end, the tally was a total of 1,779 fires which devastated 558,468 hectares (1.38 million acres) of northern Ontario forest land—an area equivalent in southern Ontario terms to a block encompassing the Lake Ontario shoreline from Pickering to Oakville and extending as far north as Lake Simcoe.

Thunder Bay 46 in July, which burned 126,748 hectares (313,200 acres) was one of the largest fires ever recorded in the province. Kenora 23 was 113,515 hectares (280,500 acres) and for some tense days in June threatened the town of Kenora, coming within 12 miles of its boundaries.

Red Lake 14 a few weeks earlier covered 43,666 hectares (107,900 acres) and forced the evacuation from the town and nearby settlements of 3,640 people to temporary quarters in Manitoba. Ignace 27 in July was the same size, and was blazing at the same time that Thunder Bay 46 was growing in size.

But the huge fires were only part of the story. At the same time as they were burning, many smaller but potentially serious fires were usually ablaze as well.

The worst of the fire season was in the Northwest and North Central Regions, from early May to late July—almost three months. During June and July, the Ministry reduced normal operations to the bare minimum and cancelled vacations of all staff qualified to work on fire control and related support duties.

At the peak period, as many as 3,600 people were on active fire suppression duty. The majority of these were MNR staff, including those sent from other parts of the province. They were assisted by contract staff and specialists borrowed from other jurisdictions, such as the United States Forest Service.

It was a superhuman effort by all concerned.

Although many structures were lost, and valuable timber destroyed, our efforts are credited with saving millions of dollars worth of property and resources. No lives were lost in the communities and outposts threatened by fire, and few private homes were burned. The fatalities recorded were two lives lost in a helicopter crash during the Thunder Bay 46 suppression operations—a private company pilot and an MNR staff member acting as a helicopter technician.

By the end of the season (October 31), $56.9 million had been spent on all aspects of fighting the fires: $39.2 million more than budgeted. Regrettably, 55 per cent of the 1980 fires were caused by human indifference—through careless smoking, neglected campfires and negligent use of equipment in the bush.

Nature had thrown a nasty curve at us in terms of weather: a dry fall in 1979 and persistent warm, dry weather very early in the spring of 1980. Consequently, moisture-parched trees, the ground and the subsoil became tinder for the fires of late spring. These came with the severe and frequent lightning storms of early May.

And as is the pattern in that part of the province, lightning in the Northwestern Region accounted for 525 fires in early summer (as many as 60 starts were recorded in some 24-hour periods).

With so many starts, it was often impossible to muster sufficient resources to make an immediate initial attack on all fires—the best way to extinguish them before they become larger conflagrations.

The fires brought about one of the most active air operating seasons in history. In May and June, over 80 helicopters hired from the private commercial sector were pressed into service. These were not enough and a search came up with an additional four from the federal military and nine from the United States. Thirty-two of our fixed-wing aircraft were used in waterbombing operations, and these were augmented with more than a dozen planes from other provinces and private companies. Fire detection was carried

Aerial view of the tip of Thunder Bay 46, July, 1980: one of the largest fires on record in the province.

Firefighters arrive at base camp 292 after battling Thunder Bay 46.

Weary firefighter takes rest break at base camp after fighting Kenora 23 in June, 1980.

out by 21 light twin engine aircraft leased from private companies in Ontario. Eight of the Ministry's planes were used for other fire management duties.

Training on the Run

The severity of the fire season meant that training programs had to be accelerated to produce the crews for the fire lines. An additional 850 crewmen were trained in 1980.

Help came during the highest pressure period from a seven-man U.S. training team which instructed 100 crewmen in a 14-day session.

Many bush-experienced native people worked on fire suppression crews.

Women are playing an increasingly important role in firefighting and its support. Last year during the fire crisis, women worked long hours as telephone and radio operators, aerial fire detection observers, drivers, camp crews, dispatchers and clerks. In the Northwestern Region, one woman supervised a huge fire equipment warehouse and another was a maintenance mechanic. We're also beginning to see female crew bosses on fire crews. All part of the realization that a physically fit woman can handle just about any fire control job.

Focusing on the Hot Spots

It may look like a prank to a casual viewer, but when a fire crew mop-up team spots a tree tangled with adding machine tape, it's a signal to go into action. The tape has been dropped from a helicopter, flying over the fire burn area. The 'copter has an infra-red unit and is looking for "hot spots." Hot spots are areas that still retain potential fire hazard.

In the helicopter, one person operates the scanner (it looks rather like a video camera) while another monitors the black-and-white images on a small viewing screen. When bright white dots appear, the pilot is signalled so they can drop the tape for the ground crew. Thus hot spots can be located and extinguished quickly.

During 1980, several different types of infra-red equipment were tested. A portable unit that can be operated by one person on the ground also proved effective at locating hot spots on a fire's margin.

A high-altitude unit owned by a private firm was useful in detecting fire fronts obscured by thick smoke. This equipment is in a fixed-wing twin engine plane that flies over the fire at about the 5,000-ft. level. It produces fire maps on a paper strip and the information can be used in a variety of ways for firefighting.

Locating the Lightning Strikes

Since lightning strikes cause a high percentage of the fires (over one-third in 1980) in the province, it makes sense to look for a method of locating the actual strikes. The year 1980 was the third year of evaluation for the lightning locator installation in Northwestern Ontario. It has proven a valuable tool for plotting and preparing for lightning-caused fires and will continue in operation.

Antennas of the locator system are installed at Kenora, Red Lake and Sioux Lookout. The central processing unit is in Dryden. It's an electronic system that records ground strikes. (Earlier systems detected all strikes—cloud-to-cloud as well as cloud-to-ground—creating a confused pattern in storm area monitoring.) The central unit prints out maps of lightning activity for use in the district and region fire centres.

Aftermath of Kenora 23 in Gordon Lake area, where the fire destroyed some private property. Considering the size and number of 1980 fires, relatively few private structures were lost.

Fire technician at Thunder Bay 46 in July, 1980, requests helicopter drop of additional suppression equipment.

1980-81 Aviation and Fire Management Program Highlights

- A total of 1,779 forest fires burned 558,468 hectares (1.38 million acres) of Ontario forest land.
- The Ministry spent $56.9 million on managing the forest fire protection program in the province; $39.2 million more than was budgeted for.
- Thunder Bay 46 was one of the largest fires ever recorded in the province. It burned 126,748 hectares (313,200 acres).
- Fire activity caused one of the busiest air operating seasons in history. Over and above the 40 MNR aircraft dedicated to fire control, an additional 93 helicopters and nearly 35 other aircraft were contracted from other governments and private sources.
- The Ministry trained an additional 850 fire crew members (as well as the usual 725 in the normal training program) to fight the fires of 1980.
- At the peak fire period, as many as 3,600 Ministry staff were on active fire suppression duty.

Regenerating Our Forests

Forest Resources Management

Last year 600 million cu. ft. of wood products were harvested from 197,000 hectares (488,000 acres) of Crown lands in Ontario. This wood is used by the forest industry to make all the wood and paper products that we use every day and to export to other countries.

In order to ensure a continuing supply of these products, the forest must be regenerated. This is accomplished by a variety of year-round activities including planting trees, gathering and sowing seeds, and encouraging nature to seed (with a little help from us). Young trees and plantations must be tended and protected from overtopping weed species to ensure growth of our future crop and the continuing success of our new forests.

To support this regeneration program as well as supply trees for private use, the Ministry grows trees in 10 nurseries located in key areas across the province.

Forest Management Planning for the Future

In Ontario, we have enough forest lands to supply us with the timber needed today for domestic use and for export. But it takes decades for most trees to grow big enough to cut. Will our children and grandchildren have enough trees?

Forest management planning is the means by which forest policy, aims and objectives are translated into a continuity of forest operations for a particular forest area. In Ontario, these forest areas are called Management Units. By planning and controlling forest operations on these units, the objective of providing trees for future generations is assured.

The forest management plans prepared for each unit provide the objectives and broad framework within which forest operations are conducted.

The objectives are based on a thorough knowledge of the forest conditions of the management unit: for example, its physical features, tree species, history and industrial use. Projected demand and the need to provide for other uses of the forest are also considered.

More detailed operating plans for shorter time periods identify the forest operations to be conducted to meet the objectives.

These operating plans indicate the timber stands to be harvested, regenerated and tended, and the roads and other improvements required on the unit.

Work planned and work done is recorded in ledgers and on maps, providing us with the means of determining how well we have met our objectives.

Co-operative Agreements for Future Forests

The Forest Management Agreement (or FMA) is a major prong in Ontario's long-range campaign to regenerate our forests for the future.

Under an FMA, the forest company harvesting a tract of land under licence from the Ministry, must also carry out forest regeneration, forest tending and associated road construction. And all these activities must be done to meet the specifics of both the agreement and a forest management plan jointly developed by the company and MNR. Silvicultural treatments are paid for by the Ministry, at its cost for equivalent work, and the road construction and maintenance program is subsidized by the Crown. The principle followed is that the most efficient forestry practice is for harvesting and regeneration to be done as integrated steps. In fact, cutting trees is considered the first step in the regeneration process.

The first five of these FMAs were signed during the last fiscal year.

The initial agreement was with Abitibi-Price Inc. covering the Iroquois Falls Forest. Two agreements were signed with E. B. Eddy Forest Products Limited covering the Upper and Lower Spanish Forests. Great Lakes Forest Products Limited signed to cover the English River Forest near Ignace. And an agreement was signed with Spruce Falls Power and Paper Company Limited for the Gordon Cosens Forest near Kapuskasing.

Ministry adviser and private landowner examine seedlings in holding bed. Under Woodlands Improvement Act, over 9,000,000 trees were planted during 1980.

Signing of first Forest Management Agreement, April, 1980. Left to right: Ken Armson, Chief Forester, MNR; Hon. James A.C. Auld, former Minister, MNR; R.C. Gimlin, President, Abitibi-Price Inc.; T. J. Bell, Chairman of the Board, Abitibi-Price Inc.; J.K. Reynolds, former Deputy Minister, MNR.

Under the terms of the agreements, each company will manage these Crown forests for a 20-year period. The company will carry out regeneration, tending, road construction and timber harvesting.

Annual allowable cuts of the forests will be calculated every five years and each company's performance will be appraised every five years as well, to ensure that the FMA is being fulfilled. If satisfactory, the term of the agreement will be extended for another five-year period.

The impact of the agreement program was immediate. Companies began staff reorganization to interrelate harvesting and regeneration functions and to improve mechanization techniques. MNR nurseries, to answer the increased demand for seedlings from the companies, began to expand production.

It is expected that the majority of all anticipated FMAs will be signed by 1985 and will comprise a total of about 30 agreements.

We Manage Private Forests, Too

Another method by which MNR's forest resources staff ensures good forest management in Ontario is through The Woodlands Improvement Act. The WIA covers privately owned lands, which are mainly in the southern part of the province.

The Act provides for the Ministry to do the managing of the forest portion of a private landholding—if the owner agrees. In this way, MNR is able to maintain the high standard of forest management required to get the most from the woodlots in private hands.

Last year, 802 WIA agreements were signed, bringing the total in operation up to 8,523. Ministry forestry workers planted over nine million trees on these lands during 1980.

Local governments and agencies which own land also enter into forest agreements with the Ministry. Last year, throughout the province, 60 forests were managed by the Ministry under agreements with conservation authorities, counties, townships and others. Management of these forests is especially important in districts that do not have much Crown land.

The Ministry also provides an advisory service for private land-owners to encourage them to improve and manage their own forests properly. The service is free and offers advice on planning and establishment of tree plantations, tending of woodlands and marketing of timber.

Every Tree Counts

An Ontarian, stuck in a traffic jam in downtown Hamilton, Windsor, or Ottawa might wish to be away in a peaceful woods at that moment, but would he or she realize that 80 per cent of Ontario *is* the woods?

And that, especially in the north, much of it is Crown forest administered by MNR's forest resources staff? And that we try to keep track of just about every stand of trees so that timbering can be controlled and regeneration ensured?

During 1980, to maintain a continuous inventory of forest stands throughout the province, aerial photographs were taken on an ongoing basis. To add detail to the aerial pictures, field sampling surveys called "cruising" the forest were also undertaken. Experts studied the aerial photographs and interpreted what they saw to produce estimates of tree species' age, height and area. All the data was then fed into a computer to be used for long-range planning of forest management.

Last year work was begun on a computer model in which the inventory can be used for much faster and more detailed and sophisticated long-range planning.

The model will provide descriptions of the forests that will result 20, 30, even 100 years in the future. The effects of alternate timber cutting and regeneration plans can be entered into the model as can the potential influence of fire, insect and disease damage. With the aid of this tool, the forestry staff can effectively plan the future of not just Crown forests but privately held stands of trees all over the province.

The aerial photographs and maps were also available to other government agencies, to industry or members of the public who use aerial views of private property for planning purposes.

Tallying the Timber Crop

Scaler measures cut timber to determine price company will pay for timber cut on Crown land.

The harvesting of timber on Crown land is undertaken by private industry under licence issued by the Minister. Last year there were 548 active timber licences covering 224,225 sq. km (94,332 sq. mi.) of forest.

The Timber Sales Branch staff decide on the harvest each licensee will be allowed, taking into consideration such things as geographic area, kinds of trees, volumes of trees, stumpage payments and harvest control measures.

When the wood has been cut, another specialist—a timber scaler—tallies the harvest to ensure that proper fees are paid for the timber cut.

There are over 2,000 licensed scalers currently in Ontario, and graduates from government-regulated courses add about 150 every year. The courses are rigorous and, to ensure that the wood measures are up-to-date, the scalers must take refresher courses regularly. Scaling is done by both men and women.

Last year, the change-over to reporting all measurements in metric units was begun. Total metric measurement should be in force by 1982.

It Starts With a Seed

Any gardener knows that you put a seed in the ground, nourish it, tend it—and watch it grow. This can also be a method for growing trees, but then there's the jack pine.

Jack pine is the great regenerator of burnt-out forests. In fact, heat is what makes the cones open and release the seeds. But jack pine can also be seeded successfully from an aircraft. If the seed is sown in the spring, it will sprout immediately; if sown in the fall, it will germinate the following spring. Last year, the Ministry sowed nearly *two billion* jack pine seeds to regenerate fire-ravaged and denuded areas in the province.

Ministry silviculture programs also see to the collection, storage and dispersal of the seed crops of our trees. During the warm months, busy hands pick the cones and seed of all species of Ontario trees. Only the black spruce seed collection has a mechanized process which involves feeding branches into a combine that separates the cones and makes them ready for normal seed extraction.

The collections go to two Ministry seed extractories (one handles jack pine exclusively) where the seeds are removed from cones or cases and then stored until required. Last year, the inventory of the seed warehouse was 5.3 billion seeds valued at approximately $3 million.

In 1980-81, a further 375 million seeds were used for nursery or container stock production and for seed research.

Research Programs Lead to Better Forests

In the long continuum from planting to harvesting of a woodland, many groups and individuals are involved in the teamwork necessary to keep the forest healthy, productive and operating at its optimum level. Not only are there the foresters who manage the woods, and those who compile and analyse forest data, but there is also a whole spectrum of scientific researchers and practitioners who study and develop ways to make trees healthier and more productive.

Forest research has, over the years, proved to be a very important adjunct to forest management. Because many studies have to be long term, with results not expected overnight, progress is steady but unsurprisingly slow. In a few cases, projects begun 25 and even 35 years ago are only now yielding important data and results.

Last year MNR researchers worked on a great variety of projects. One important area was work on selecting tree species for preferred characteristics: fast growth, stem development, winter hardiness. Programs using controlled pollination to increase seed production also had high priority.

Foresters have developed ways to preserve the gene pool and propagate trees from existing stands of native trees to assure the continued life of this breeding stock.

Methods of extending planting seasons to increase the number of trees planted, to improve the soil chemistry and many other facets of tree planting were concerns in Ministry labs and nurseries.

Scientists gave consideration to all species, though those that have high potential for timber crops were emphasized: hardwoods for wood products and softwoods for pulp and paper manufacture.

Pest and environmental control and nursery research also played a part and will continue to produce new data as research continues to keep pace with forestry's steady growth into the future.

Poplar No Longer a Weed

Most Ontario trees take a long time to mature. But not so for all of the poplars. Although disclaimed in some areas as a "junk" tree, the quick-growing kind has many uses other than the production of fibre, including planting as "nurse" trees to protect other seedlings during early growth or as windbreaks or cover foliage.

Results of Ministry research on hybrid poplars—trees deliberately cultivated for even faster growth, greater yields and other desirable qualities—have shown that these hybrids have great potential in several areas, besides providing fibre for eastern Ontario pulp mills. They can also be used as energy fuels or cattle fodder and in the manufacture of adhesive products, and to produce artificial sweeteners.

To create a hybrid poplar, shoots are taken from both male and female poplar trees selected for certain desirable characteristics. The shoots are kept in pails of water in a greenhouse, and when they blossom, are artificially cross-pollinated by hand with a brush. After three to four weeks, the female blossoms will produce seed from which the new hybrid will grow.

The most favorable plants are used to start a hybrid plantation (based in eastern Ontario locations such as Kemptville and Brockville). And they do grow quickly.

Some varieties can grow to a height of 10 to 12 feet in one year and be nearly a foot in diameter at age 10. Though you can grow hybrid poplars by sticking stem sections of a certain length into the earth, research is under way on planting smaller lengths of poplar horizontally in shallow trenches. This offers some promise for mechanized planting.

The success of the poplar program has led researchers into similar studies of a related tree—the willow—also a fast grower with some potential as an energy substance producer.

No Ordinary Trees Need Apply

White spruce are valuable pulp and paper trees prevalent in northern Ontario. Their natural occurrence in southern Ontario is pretty well limited to surviving natural forest stands in scattered areas.

Much of the natural genetic stock that once populated our forest has been lost over the centuries, especially in southern Ontario. It is necessary to preserve those trees that remain so that the genetic material is retained for posterity and can be used as a basis for breeding. Such stocking trees are known as gene pools. An inventory of the existing stands in southern Ontario was done in 1980.

Last year, a similar program for selection and improvement of black walnut stands in southern Ontario was begun. This project requires a very careful inventory to choose superior trees for producing future stock. Propagation is by grafting on root stock. Seeds produced will be planted and the best seed progeny will be kept in a gene bank.

Surveys to locate and select superior stands of white ash have led to a similar program of tree development for this species. Again, by propagating the best trees, a gene bank will be established from which seed orchards will be planted.

Hardwood Stump Sprout Regeneration

After hardwood is cut, or after a forest fire, stump sprouting can account for a great part of the reproduction of the forest. Many hardwood species can be reproduced by stump sprouting relatively simply, quickly and inexpensively, thus providing supplemental stock for regeneration.

An MNR study in 1980 looked at sprouting, following tree cuttings in a red oak/white ash/sugar and red maple stand in Huronia District the year before. The stand was 60 to 80 years old. Some of the findings: the older and bigger around the tree, the less it tended to sprout (only one in 10 of the 80-year-old red oaks produced sprouts). White ash and red maple stumps sprouted more frequently than red oak.

A number of factors influencing sprout development need to be studied—season of cut, height, bark thickness, sprout number, size and location and incidence of decay fungi—and results must be correlated to give guidelines for this kind of regeneration. But, given specific methods of treating sprouts, it may be possible to produce a new stand in this manner.

Testing Seedlings for Dormancy and Frost Hardiness

Early spring is a particularly busy time for MNR nursery workers and planters. During the few short weeks of the best planting conditions, some 60 million bare root seedlings must move through the various stages between removal from the nursery bed to eventual planting in the forest.

A great saving in time and manpower can be achieved if the trees don't have to be harvested from the nursery, then graded and packed, as well as being transported and planted during this short period, but can be simply retrieved from cold storage, ready to plant.

Some of the nursery operations could then be done in the fall, and for the best survival of the stock, would be done when the seedlings have reached their natural winter dormancy stage.

MNR research staff have been working on several methods to test the young trees in order to develop a standard method of identifying the period when they have entered the dormancy phase. They are also concerned with testing for frost hardiness in the seedlings, which is linked to dormancy.

In 1980-81, work was well under way on a program to test for dormancy by monitoring the changes in the amino acids present in the root and needle tissues of conifers. An extraction technique was developed.

Amino acids were extracted from the seedlings weekly during the fall and compared with material extracted during other periods. Preliminary findings indicated that distinct amino acid patterns occur. Once a consistent pattern is established, a standard test can be developed for determining a seedling's degree of frost hardiness and its stage of dormancy.

Forest research scientist uses oscilloscope to test conifer seedling for dormancy.

The Effort to Control a Persistent Pest

It's just an insignificant, buff-colored moth floating—with thousands of its fellows—through a northern forest. Yet this harmless-looking insect produces a terrible child. Laying its eggs on the inviting needles of conifers in August, the moth dies. The larva that emerges in the spring and immediately begins munching its way through the balsam and spruce needles, is the spruce budworm and it's been plaguing our forests for decades.

By late spring, each tree can have thousands of the budworm caterpillars defoliating and eventually killing the tree. Though only an inch-and-a-half long when fully grown, the budworms have voracious appetites. They have already destroyed about 60 per cent of balsam in northeastern and northern regions. Not content, the budworm has turned

Spruce budworm (actual size is about an inch-and-a-half long) is subject of MNR pesticide spraying program to save balsam and white and black spruce forests.

to destruction of the more valuable white and black spruce.

So far, no one has been able to explain periodic plagues of budworm (the last big one was in the late 1940s and early 1950s). But Ministry staff members are beginning to control the horde through the yearly spraying program. Last year brought the best success in 12 years, achieved through a combination of expertise, good spraying weather and an effective combination of pesticides.

The 1980 aerial spraying program covered forests in the Kirkland Lake, Parry Sound, Chapleau, Gogama, Cochrane, Kapuskasing and Hearst districts. Fourteen spruce seed producing areas and one wildlife management area were in the spray zone. Both chemical and bacterial insecticides were used. The bacterial insecticides contain a bacterium specific to the budworm, that kills on ingestion; the chemicals kill through contact or ingestion.

Thirty days before the spraying began, the public in each area was notified and residents were invited to go into the regional office to discuss the program. Sprayed areas were all posted.

After spraying, evaluation teams went into the forest immediately to monitor results. In all cases, findings showed effective elimination of budworm with no hazard to human health and no significant damage to wildlife.

MNR's forest resources scientists have also begun to examine methods for biological control of the pest. These are long-term programs, because even when this infestation is over, the budworm will be back in a decade or so. Since the budworm has little potential for sterilization methods, the pilot field projects are investigating use of budworm parasites, predacious insects (ants, wasps) and nesting birds (chickadees, warblers) as methods of control.

Prevention and Control of Other Pests

Surveillance is an important part of pest control. Knowledge of what to expect, watching for its incidence and being ready to combat it when it appears, all contribute to the effectiveness of the program. A good example is *Scleroderris canker.* The European strain of this fungus has infested red pine plantations in New York state and parts of Quebec, causing severe damage to the trees. It has not yet border-skipped into Ontario, but the pest control units are alert to the possibility. Co-operative federal-provincial programs helped maintain the surveillance in 1980.

Since trees cannot be vaccinated to prevent the fungal attack, control will be rather similar to the method used to eliminate smallpox from the world. Once infestation is sighted, teams will enter the area and deal with the local outbreak to keep it from spreading. In this way, widespread infestation can be prevented.

Pest control dealt not only with insect and organic pests last year, but also was challenged by rodent (mice and rabbits) assaults on young trees during the winter. If rodents are not controlled, considerable damage can be done to valuable young timber. The creatures eat the bark around the trees at the snow line and this "girdling" around the tree can be serious enough to kill it.

BILD Funds to Improve Forest Management

Technician measures test hybrid poplars to determine which nutrients produce best trees in shortest time.

The Board of Industrial Leadership and Development (BILD) program, announced in January, 1981, established a new economic development strategy to consolidate and co-ordinate the government's total economic development. BILD is a Committee of Cabinet with a $1.5 billion budget aimed at creating jobs, reducing inflation, increasing trade and improving productivity. It will work on joint projects with other governments and private interests, as well.

As an adjunct to existing forest management programs, $10 million has been earmarked by BILD to be used to improve southern Ontario woodlots and stimulate development of pulpwood and high-quality sawlogs. In the north, $25 million will be used in the management of Crown forests not under Forest Management Agreements.

Immediate effects of this impetus will be an increase in the availability of fuelwood for Ontarians in these energy-conscious times, and the creation of jobs in forest and forest-related areas.

BILD is also funding a $10 million program to improve MNR's tree nurseries. Seedling production will be increased across northern Ontario and improvements will be made at most provincial nurseries. Implementation of the Forest Management Agreements between the Ministry and industry will increase the demand for seedlings for forest regeneration, so construction of new nursery capacity and enhancement of existing facilities is most timely.

1980-81 Forestry Program Highlights

- The Ministry supervised the regeneration of almost 102,000 hectares (251,000 acres) of forest.
- Our nurseries produced 75.9 million trees.
- Agreements with private landholders under The Woodlands Improvement Act increased by 802 to 8,523, bringing 144,779 hectares (357,748 acres) under agreement.
- In agreements under The Forestry Act, over 110,000 hectares (272,000 acres) were managed.
- The Ministry supervised the aerial spraying of herbicides and insecticides over 36,422 hectares (90,000 acres) in the province.
- A major review of private land forestry in Ontario was initiated.

Mineral Resources Management

New OMEP Program Assists Mineral Exploration

Maps and data produced by MNR geological surveys and MNR regional resident geologists offer exploration assistance to the individual prospector as well as to large companies.

The tradition of encouraging mineral exploration in Ontario is a long and successful one. The latest initiative was the introduction in September, 1980, of the Ontario Mineral Exploration Program (OMEP), an expanded approach for revitalizing mineral exploration.

OMEP replaced the Mineral Exploration Assistance Program (MEAP) which had operated successfully for 10 years.

The new program offers risk capital and other incentives to encourage exploration. It is available to qualified individuals and companies not directly engaged in mining activities. Individuals can receive grants equal to 25 per cent of exploration expenses and companies can ask for tax credits equal to 25 per cent of exploration expenses.

Between its September inception and the end of March, 1981, OMEP received 138 applications. Of these, 94 projects totalling $33.9 million in planned exploration expenditures were approved for assistance. A total of $1.4 million in grants/tax credits were paid in 1980-81 for the seven months the program was operational.

With the stimulation of the OMEP program, Ontario should witness an increase in exploration in 1981-82 which will encourage new mine development, create jobs and provide economic impetus, particularly in the northern part of the province.

Mining Taxation Offers Incentives to Producers

In 1980-81, the total estimated value of the province's mineral production to be assessed and audited under The Mining Tax Act exceeded $4.5 billion ($3.27 billion in 1979-80.

This amount of production resulted in a record tax revenue in 1980-81 of more than $160.5 million. The tax is determined by the Mine Assessor by appraising the value of output at the pit's mouth.

The Mining Tax Act also provides incentives to mineral producers to encourage exploration, production and processing in Ontario.

Incentives for exploration and development allow a 100 per cent writeoff of expenditures incurred in the province. The processing incentive gives capital cost of processing assets, based on the degree and location of the facilities.

These incentives have been instrumental in stimulating mineral companies to make major investments in Ontario.

Geological field team examines core sample. Such surveys provide clues to mineral deposits by revealing nature of soil, clay, glacial till, sand, gravel and underground rocks.

Geological Survey Teams Look for Clues

Examining rock sample, student participates in survey team's efforts to locate potential mineral deposits.

MNR's Ontario Geological Survey has been mapping and studying the surface and below-surface mineral resources of Ontario for nearly 100 years.

Last summer, 51 field survey teams scoured the rocky landscapes to pinpoint potential places where commercial exploration for metals and rocks might best occur.

Many university students are employed as summer assistants on the various geological survey projects. Last year the Ontario Geological Survey hired nearly 140 university students on several OGS programs.

To date, only seven per cent of the province's Precambrian geological profile has been mapped to modern standards of detailed scale.

Through mapping, then analysing the results of their studies of the earth's surface, glacial deposits and bedrock, MNR geologists produce data that is useful in two areas. Using sophisticated scientific equipment and applying up-to-date geological concepts, they look for indicators that may lead to the discovery of base metals; gold, silver and other precious metals; sand, gravel and stone for construction; uranium, peat and oil for energy.

Inventories are also made of these resources and the geological information contained in them enables better land use planning.

Some current projects under way are: the tracing of river valleys more than 2 billion years old that may contain deposits of gold and uranium comparable to those in South Africa; the analysis of large gold-bearing fold structures formed more than 2.6 billion years ago by continents grinding past one another along faults much like the San Andreas Fault in California; the unravelling of the complex geology of the Sudbury Basin and its rich ore deposits believed to have formed by meteorite impact 1.8 billion years ago.

Last year's published reports and seminars on the structures controlling metal distribution in the Sault Ste. Marie-Sudbury-Cobalt region have reawakened interest in a dormant area, with several substantial exploration programs in progress.

Results of the OGS projects are designed to help not only the exploration and mining companies (Ontario leads Canada in the production of cadmium, cobalt, gold, nickel, silver, uranium and zinc and is the sole Canadian producer of calcium, magnesium, platinum and nepheline syenite) but also the individual prospector.

MNR staff also help municipal planners in southern Ontario, particularly in respect to aggregates—sand and gravel deposits. A great number of geological advisory services are available to the public and many comprehensive publications are issued yearly—a total of 430 maps, reports, studies and papers last year.

MP 77, Index to Published Reports and Maps, Division of Mines, 1891 to 1977 and Supplements, is updated every year to list all OGS and Mineral Resources Branch publications by document number, author name and geographic entity. Other reports updated each year for reference purposes are: Summary of Field Work, Annual Report of Regional Geologists, Oil and Gas Papers and Rocks and Minerals Information.

Mineral Reports Published

Although Ministry programs encourage the search for and the development of the province's mineral resources, MNR also acts as the custodian of Ontario's mineral potential.

Management must be flexible, stimulating growth when needed and guarding against excessive regulations.

By examining Ontario's metal and industrial mineral resources and production in light of world market developments and trends, and by developing sound policies that take into account technological, environmental and economic factors, the health of our mineral resource sector can be maintained.

To this end, reports, studies and statistics on metallic minerals and market conditions are produced—to provide background information for government, industry and universities.

Over the past few years, several commodity studies have been published as Mineral Policy Background Papers. Zinc, nickel and platinum have been covered. Work was completed, in 1980, on studies on uranium and gold.

New BILD Program Encourages Mineral Development

In March, 1980, The Board of Industrial Leadership and Development (BILD) announced several programs to stimulate mineral exploration and research.

One is a $10 million project to facilitate the construction of custom gold milling facilities in several areas of Northern Ontario.

Another program will establish 11 drill core libraries across the province at a cost of $5 million. Permanent storage and retrieval of drill cores will save exploration costs by reducing the need to re-explore and re-drill in specific areas.

Industrial mineral exploration will gain new impetus through a new program of loans and grants in a five-year $7.7 million program to encourage search and development of phosphates, silica, talc, potash feldspar, magnesite, mica, whiting, barite, building and ornamental stone and kaolin.

Ontario's own energy resources will be assessed by a $12.6 million, five-year BILD program. Known as the Hydrocarbon Energy Resources Program, it will include an evaluation of lignite deposits in the James Bay Lowland, an inventory of peat deposits in the entire province, and an investigation of possible oil shale deposits in southern Ontario.

BILD is also financing a "technology breakthrough" fund to help private companies develop new ways to locate now-undetectable mineral deposits.

Outside Funds Expand MNR Programs

A geoscience survey program jointly sponsored by the Ministry of Natural Resources and the Ministry of Northern Affairs stimulated exploration activity in the Atikokan area following release of geophysical maps in January, 1981.

By February 2, within weeks of the release, more than 800 claims had been recorded.

The survey included an engineering terrain study, an aggregate study, bedrock mapping, mineral deposit studies of gold and base-metal occurrences, an airborne geophysical survey and preparation of data series maps.

The survey also led to the discovery, in July, of a highly promising gold vein—the Bernie-Mitch vein—named after the MNR geologist (Bernie Schneiders) and the prospector (Mitch Witcheruk) who found it.

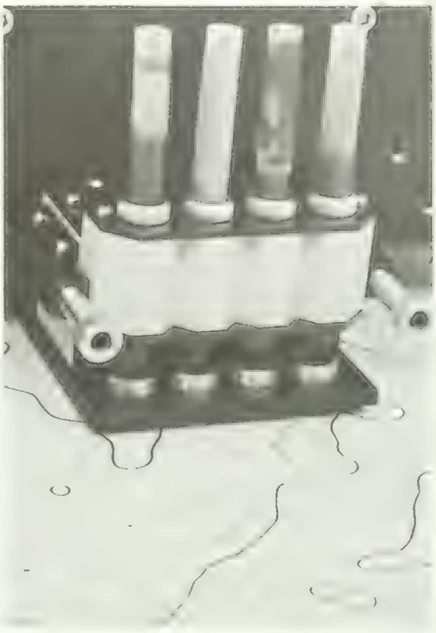
KLIP Program Boosts Exploration in Kirkland Lake

Special studies and mapping of the Kirkland Lake area have led to an exploration boom in that area. The Kirkland Lake Initiatives Program is funded by the Canada Department of Regional Economic Expansion and by the Ontario Ministry of Northern Affairs—but all technical portions of the program are handled by MNR's Ontario Geological Survey.

The surveys are exploring known gold areas to see if detailed knowledge of the geology can help in locating new finds. Sampling studies of certain types of glacial deposits show promise of locating the source of glacially-buried mineral deposits. Deposits of aggregates have been located in several areas and surveys with drilling and other sampling equipment look promising.

Focus on Northern Resources

A five-year study of the geology of Northern Ontario, appropriately called the Northern Ontario Geological Survey Program, completed its third year in 1980. Funded by the Ministry of Northern Affairs, the projects consist of various mapping and commodity studies to encourage mineral exploration.



Up-to-date equipment, such as this automatic map plotter, which produces four-colour contour maps, enables MNR to publish hundreds of maps each year.

MNR's Ontario Geological Survey coordinates these projects.

The Study is looking into some previously unexplored areas and is also zeroing in on the Atikokan, Cobalt-Gowganda, Sudbury and Manitoulin Island areas. Localities with potential for both metal-producing and industrial minerals are being sought out. The survey has located high-quality dolostone resources on Manitoulin Island, and already their development has begun with the opening of a large quarry near Meldrum Bay.

Prospectors and other interested parties have been eagerly purchasing maps from an extensive airborne survey last year of the Manitou-Stormy Lake, Wawa and Caribou Lake areas.

New Reports on Pembroke-Renfrew

Five new reports on the Pembroke-Renfrew Geological Survey (begun in 1976) were issued in 1980-81. The survey is encouraging exploration and resource management in the area and, to date,

Towards Legislation on Pits and Quarries

favorable results have been experienced.

Funded by the Canada Department of Regional Economic Expansion and the Ontario Ministry of Treasury and Economics, the MNR survey has produced three earlier reports and six maps. A booklet publicizing the program, and two final reports are on their way.

First Detailed Precambrian Maps of Southeastern Ontario Areas

A program to chart the resources of an area of southeastern Ontario (Renfrew, Hastings and other eastern counties) has resulted in the first geological maps of the very old (Precambrian) rocks in Belmont and Methuen Townships and the Ardoch Lake area.

Several survey teams have been mapping and doing industrial and metallic mineral studies as well as aggregate resource assessments. An airborne geophysical survey and an engineering terrain evaluation are also under way. Last year, a number of areas with abundant coarse aggregate deposits were located.

The program is funded by the Canada Department of Regional Economic Expansion and the Ontario Ministry of Natural Resources under the minerals program of the Eastern Ontario Subsidiary Agreement.

Search for Industrial Minerals in North

A large-scale survey for deposits of industrial minerals (such as talc-magnesite-asbestos) is part of a long-range (five-year) program begun in 1979 with funds from the Ministry of Northern Affairs. Six projects of a scheduled 10 are under way in this Northern Industrial Minerals Survey.

Studies of deposits of nepheline syenite, potash feldspar and silica have led to staking, property acquisition and further study by commercial firms.

During 1980-81, the rehabilitation security deposit was raised to eight cents per tonne (metric) from the previous two cents per ton rate to provide greater encouragement for sand, gravel and limestone extracting companies to rehabilitate worked-out pits and quarries.

Concurrently, all of the townships were designated in the Southwestern and Central Regions and in most of the Eastern Ontario Region, to ensure uniform administration of The Pits and Quarries Control Act.

Also during the year, much effort was made towards getting legislative approval of the proposed Aggregates Act, which would strengthen The Pits and Quarries Control Act (1971). The proposed new act received second reading in December, 1979, following which the Standing Committee for Resources Development heard representations from members of the public and interested organizations. Over a hundred amendments were tabled as a result.

It is hoped that the proposed Aggregates Act will receive legislative approval during the 1981-82 year.

Facelifting the Land to Cover the Scars

Deposits of sand, gravel and rock that can be crushed into stone (aggregates) are important economic assets to a community. They are also a leading part of Ontario's mineral production.

With an aggregate deposit nearby, a community has handy building materials and a source of jobs and revenue. However, there's a price to be paid.

The resource is non-renewable; largely the result of the last ice age. More sand, gravel and stone will not grow to fill the holes in the landscape.

Consequently, under The Pits and Quarries Control Act, administered by the Ministry, a program exists to encourage and enforce rehabilitation of these areas and already much has been done.

The Act specifies that while a pit or quarry is in operation, the operator must plant trees and foliage to screen the operation. Progressive rehabilitation is encouraged during the phases of the excavation so the whole job won't have to be done afterwards.

A rehabilitation security deposit is required of the operator to help recoup

Before and after photos of rock quarry demonstrate how rehabilitation programs are able to return pits and quarries to pleasing landscape—or even recreational facilities—after use.

the costs of changing open pits and quarries back into a gentle, rolling landscape. This is the deposit which was raised from two cents to eight cents per metric tonne last year. This deposit earns interest and the operator can get a yearly refund if he has complied with the terms of the rehabilitation program.

All of southwestern, central and most of eastern Ontario are governed by the Act. There is also a related program to rehabilitate pits and quarries in the province that were abandoned after past operations.

Counting the Aggregates Supply

Another program under way is to take inventory of the aggregate resources (sand, gravel, stone) of all municipalities in southern Ontario.

During the year, Engineering and Terrain Geology teams published 29 Aggregate Resource Inventory Papers (ARIP). By keeping track of this non-renewable resource, future planning and rehabilitation will be facilitated.

Last year, with the help of funds provided by the Ministry of Northern Affairs, the ARIP surveys expanded to include North Bay, Hearst and Kapuskasing.

The Costliness of Long Distance Gravel

An independent study commissioned by MNR to find out if it was economic to transport sand, gravel and stone into Toronto from further reaches of the province, proved that it would be very expensive indeed.

Results of the study, released in March, 1981, showed that it would cost at least $100 million every year over and above the cost of aggregate produced locally to move material by rail from Bruce, Grey and Huron counties. Transporting material from other areas by truck and rail would be even costlier in terms of capital, operating and energy needs without any overall reduction in environmental impact.

The study suggested that the Toronto-Hamilton area should continue to use close-to-market sources, and recommended several methods to improve delivery of the aggregates. Among the recommendations: new access roads between extraction sites and major roads; designation of special routes for aggregate haulage; surfacing of haulage roads; and construction of truck climbing lanes.

Gamma Rays Scan for Gold at the Kerr Addison Mine

The Kerr Addison Mine, one of the great gold-producing mines in the Larder Lake area, was used last year in a study which may develop a useful prospecting tool for gold-seekers.

Because gold can be difficult to locate through normal sampling methods, a gamma-ray spectrometer was used to sample underground mineralization at the mine.

Kerr Addison is a mine in which gold occurs with carbonate rocks containing potassium. When scanning the rock with the spectrometer to locate the potassium, the researchers were able to detect a definite link between the gold-bearing areas and the potassium content.

In the future, a drilled bore hole in a similar geological structure could be checked by lowering a device to take a potassium reading.

The level of potassium recorded would give the prospector an indication of possible gold potential.

Gravity Study Measures Huge Northern Basin

Imagine trying to find a pearl in the bottom of your swimming pool by feeling along the top of the water. That's similar to the task of the three-year gravity study just completed in the Sudbury-to-Cobalt area of northern Ontario by the Ministry geophysicists.

The area is an ancient rock basin filled with younger sedimentary rocks in varying depths. It's a mineral-rich area with gold and silver and other ores—but traditional search methods are expensive. A gravity study is one way to form a picture of the topography of the ancient base rock and the varying thicknesses of the sediment.

For the past three years, geophysicists have been measuring the density and gravity of the surface rocks of the area. The data collected will now be fed into computers to come up with tables that give a profile of the lower structure.

This data base, which should be available during the next year and a half, should

Technician in geoscience laboratory uses the Inductively Coupled Plasma-Optical Emission Spectrometer to test for up to 36 elements in sample.

encourage exploration companies to examine the area for likely ore deposits.

New Spectrometer Fast Analyser

Installed last year at MNR's geoscience laboratories, the Inductively Coupled Plasma-Optical Emission Spectrometer is one of the most up-to-date analytical instruments available. When analysing the samples from a wide range of environments—rocks, minerals, ores and concentrates, stream and lake waters—the spectrometer can produce a simultaneous readout for the concentrations of up to 36 elements in less than ten minutes, a vast improvement over previous methods.

The spectrometer has an argon plasma (flame) which provides a stable, high-temperature source that ensures efficient sample decomposition and excitation. Light from the "excited" atoms in the sample passes through an optical reading system. The intensity of the light gives a measurement of the elemental abundance in the sample. Data of standards stored in the spectrometer's electronic system is compared with each of the 36 elements to provide accurate analyses.

Elements that can be determined range from the most abundant elements—iron and aluminum, for example—to elements that occur in trace amounts such as chromium and europium. Thus the labs have an accurate, sensitive, precise and rapid method of testing for a wide range of elements.

Volcanic Rocks Show Their Age

Rocks, unlike many people, can be persuaded to reveal their age.

When you are dealing with the most ancient rocks of the Precambrian Shield which are 2.6 to 3.1 billion years old, you are looking at the results of volcanic activity that, in some areas, produced the richest ore deposits in the province.

If you had a method of dating these rocks to within plus or minus 2 to 5 million years of their birth, it's a reasonable basis for correlating data in a prospecting search for good ore deposits in rocks of a specific age.

A geochronology program has been collecting samples of Precambrian rocks. Last year this was done in the Trout Lake area, Kenora District. In this case, a geochronologist worked with the area geologist to locate likely sources for the study.

The geochronologist collected 45 kg (100 lb.) samples of surface rocks and took them back to the geochronology lab located in the Royal Ontario Museum. Here, scientists crush the rock and then further process it, extracting the zircon content.

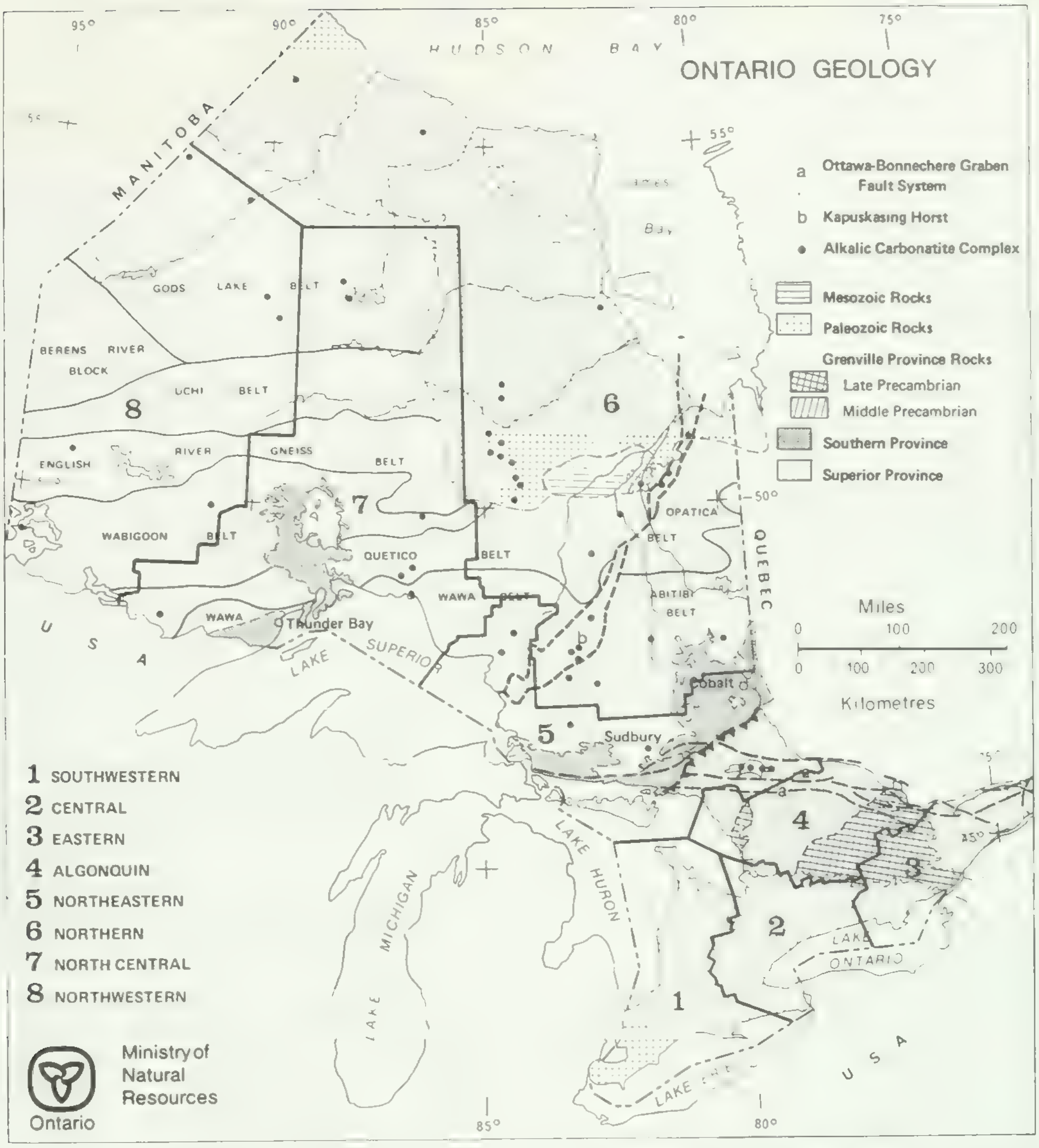
Next, the zircons were selected, altered portions abraded off and the cores dissolved and looked at with a uranium-lead mass spectrometer, a device that is used to deduce the age of the rock. Scientists have developed high accuracy with the dating process. Their reports should yield valuable exploration assistance.

Geoscience Research Grants

Since 1978, the Geoscience Research Grant Program of the Ontario Geological Survey has been awarding funds to universities for research projects that will be of interest and aid to mineral prospectors and developers. In 1980, grants totalling $499,600 were awarded to ten universities for 29 research projects.

The program supports projects of up to three years' duration and papers are presented, along with other OGS papers, at the annual Geoscience Seminar held in Toronto.

Highlight of last year's seminar (attended by 500 geoscientists from industry, universities and government) was a project that could resolve the problem of radium pollution in water wastes at mines. Project researchers at the University of Western Ontario, headed by Dr. William S. Fyfe, have come up with a new treatment for radioactive wastes. In the laboratory, it has effectively reduced radioactive contamination of water.



1980-81 Mineral Program Highlights

- Total estimated value of mineral production, to be assessed under The Mining Tax Act, exceeded $4.5 billion and realized a record high revenue of $160.5 million in taxes.
- Under the new Ontario Mineral Exploration Program (OMEP), 94 applications were received for a total planned expenditure of $33.9 million for exploration purposes in the province.
- A total of 140 scientific reports and 290 geoscience maps were produced by the Ontario Geological Survey.
- The Ontario Geological Survey sent out 25 regular field survey crews and 26 crews on behalf of other agencies.
- Twenty-nine grants totalling $499,600 were made to 10 universities under the Ontario Geoscience Research Grant program.
- An independent long-range study on transportation of aggregates from remote areas to urban centres was published during the year.
- Comprehensive commodity studies on gold and uranium were completed.
- Six special joint survey programs funded by MNR in partnership with various other government agencies (such as the Ontario Ministry of Northern Affairs, Ontario Ministry of Treasury and Economics and the Canada Department of Regional Economic Expansion) received $3.1 million last year.

Lands and Waters Management

Draft SLUP Plans Released for Public Comment

During 1980-81, the Ministry released draft versions of three Strategic Land Use Plans (SLUP) to the public for comment. For this program, the province is divided into three regions—northwestern, northeastern and southern Ontario—and plans were prepared for each.

MNR staff employed a wide variety of approaches throughout the province to inform the public about the SLUP drafts and to seek responses. During the coming year, the public reaction and comments will be assessed. From this and other studies will develop the final versions of the three comprehensive Strategic Land Use Plans.

The three regional SLUP plans will provide policy direction for the more detailed land use plans being prepared for each of the Ministry's 47 districts. District plans follow the same planning process, but give more specific detail.

Preparation continued during the year on the West Patricia Land Use Plan, a project begun in 1976 because of the proposed licensing of new Crown timber limits north of Dryden to Reed Paper Limited.

This plan for a special area of northwestern Ontario will be a composite of the Red Lake, Sioux Lookout and Geraldton distict land use plans. A complete package on background information and policy approach of the West Patricia plan is scheduled to be released during 1981.

What is Land Use Planning?

Land use planning is the process by which decisions are made as to how the various components of the province's lands and waters can be used most efficiently.

Crown lands make up 87 per cent of Ontario's area and, as the province's official manager of this vast wealth, the Ministry must plan carefully so that the various resources will be used for the greatest benefit of the people of Ontario.

There are many uses to which land can be put: recreation (hunting, fishing, canoeing, etc.), mining, forestry, housing, industrial facilities and agriculture, to name a few.

A land use plan is a comprehensive document that is developed by an MNR planning team. The team consists of specialists from various disciplines, such as biology, forestry, geology, agriculture, environmental studies and recreation planning.

The interested public plays a most important part in the development of land use plans. The Ministry has developed a step-by-step planning process in which public participation is among the required steps. The public is provided access and input to the process at the data-gathering, policy and draft plan stages.

When the initial studies have been done, policy determined, and the questions of existing uses and potential capability of the lands and waters have been fully discussed, a draft land use plan is prepared and released to the public. Public comments on the plan then enable the Ministry to make revisions if they are required, and to work toward a final plan.

In southern Ontario, where most of the land is privately owned, the strategic land use plan is called the "Co-ordinated Program Strategy for the Ministry of Natural Resources in Southern Ontario."

This is because land use planning in this area must be done under a different set of conditions. Ministry targets for resource use must be achieved primarily on private land in organized municipalities.

Consequently, instead of directly managing the land resource, as is done on Crown land in northern Ontario, the Ministry must emphasize extension programs, technical assistance and other forms of encouragement to private landowners. Also, MNR's land use plans must be co-ordinated with local municipal planning. The plans will be used by MNR staff to guide them in the management of lands, waters and other resources.

Water control and land use planning are important aspects in MNR's management of the 87 per cent of the province which is Crown land.

Basic Mapping Will Reduce Inaccuracies

The Ontario Basic Mapping Program completed its start up phase of three years during 1980-81. The overall program—scheduled to be completed over 13 years—is being carried out by private mapping companies under contract to the Ministry, and has been designed to overcome a serious problem that currently exists with Ontario maps.

Those who use maps more sophisticated than standard road maps—transportation planners, land use planners, resource managers, mineral explorers, land developers, vacationers, hikers, etc.—recognize that Ontario needs a basic mapping system which provides maps that are compatible with each other.

Maps may be at different scales, but there is a clear need for any point on one map to have the same map reference it has on another map. No such common referencing system previously existed in Ontario.

In fact, there are maps now in use, produced by different agencies, which show differences of as much as a quarter of a mile in position and up to 100 feet in altitude.

The Ontario Basic Mapping Program, when completed, will eliminate the need to use maps which have such differences.

The problem stems from the fact that, because maps are produced on flat paper and because the earth is curved, map positions can never be precise.

Map-makers have been trying for centuries to solve this problem. With current technology, the maps currently being produced by the Ministry come as close as possible to providing a solution.

The Ministry's new maps use a reference system that has wide acceptance: the Universal Transverse Mercator (UTM) grid system.

The referencing grid provided by the UTM system is used by the federal government, NATO, several other provinces, and over 50 other countries. The system divides the entire globe into zones, each of which is uniquely numbered. This means that any point within a zone can be identified by its own co-ordinates and, since no two points can have the same co-ordinates, any point can be compared and related to another easily and exactly.

The Ontario Basic Mapping Program is producing maps at three different scales: 1:20,000 and 1:10,000 in northern and southern Ontario respectively and at 1:2,000 in urban areas. But regardless of the scale, all the maps are compatible, since they are based on the same referencing system. They are also compatible with existing federal government topographical maps. However, the Ontario maps are much more detailed.

As an example, an area that appears as a small square on a map that is not very detailed (on the 1:250,000 scale) can itself be the area shown on an entire map at a more detailed scale (1:2,000).

COSINE System Testing Nears Completion

In 1980-81, the Ministry neared the completion of tests on its COSINE (Coordinated Survey Information Exchange) System. It is anticipated that the system will be ready in the coming year.

COSINE will eventually revolutionize the entire field of control survey information (information about latitudes, longitudes, elevations, etc.) in Ontario.

Control survey information is needed to relate different points on the surface of the earth to each other with precision. Control surveys make it possible, for example, for engineers to start constructing a bridge or a subway from two different ends and guarantee that the structures will meet in the middle.

And, using control survey information, engineers can determine exactly how much higher or lower one point is than another.

At present there is a great deal of control survey information about Ontario, but it is scattered throughout the province in various government ministries, in private land surveyors' notes, in municipal offices, and elsewhere. The COSINE system is designed to promote greater efficiency by integrating all control survey information for the province.

All the available data will eventually be stored in a central computerized data bank, and will be accessible to the public, the engineering and surveying communities, and to other interested parties. This means that people who need the information will have all of it at their fingertips, and won't have to conduct extensive and time-consuming searches for information.

Another advantage of the COSINE system is that it will enable the compilation and calculation of the data for an international project to redefine the parameters of the shape of the earth. This project, which involves the governments of Canada, the U.S., Mexico and Denmark, was begun in the early 1970s and will be completed in 1984. After 1984, MNR staff will use the COSINE system to recalculate Ontario data—a project that may take several years.

New Version of Land Use Planning Guidelines

A revised edition of the Guidelines for Land Use Planning was issued during 1980. The original Guidelines had been in effect since 1974.

An OCRS scientist studies the film from a recent aerial photography mission, using a stereoscope for three-dimensional viewing.

Satellite Technology Assists Land Use Planning

How much land is there in Ontario? How much of it includes water, wetlands, forests, cleared land? Exact answers to these questions are not easy to come by because no one knows in detail all parts of Ontario's vast terrain.

A Ministry program using remote sensing technology was initiated during 1980-81 to get accurate answers to the questions posed above.

The project combines the skills of the Ministry's land planners with specialists of the Ministry's Ontario Centre for Remote Sensing (OCRS).

The OCRS is taking an inventory of land use and land cover types through the computer analysis of data on the earth's surface transmitted by orbiting LANDSAT satellites. Although the satellite orbits at an altitude of some 570 miles, it can discriminate areas as tiny as one acre (tiny, that is, from so great an altitude) with accuracy.

Thanks to a new map production technique developed last year by the Centre, once the satellite data is analysed, color maps can be produced within a few hours, using a computerized printer.

Wetlands are a good example of a present land resource which the Ministry would like to know more about. Wetlands—usually considered simply as bogs and swamps by the layman—actually teem with life and potential resources.

Wetlands provide essential habitat for many species of our native wildlife, such as caribou and many kinds of waterfowl.

It has been suggested that Ontario's wetlands contain Canada's highest reserves of peat. Our province's peat resources may one day be extracted from wetlands not just for use in gardens as peat moss, but also as fuel for generating heat and electricity.

Through the new technique of computerized map production from the analysis of satellite data, the OCRS has begun to map the various types of wetland which exist in Ontario's far north. During the

OCRS scientists from three fields (forestry, geomorphology and land use planning) instruct a computer in the analysis of satellite data.

summers of 1978 and 1979, field samples were taken in selected areas to supplement the satellite data. In 1980-81, the first wetland maps were produced.

Technology Transfer Program Started

During 1980-81, a program of technology transfer was initiated by the Ontario Centre for Remote Sensing.

The Centre's technology transfer program is aimed at three specific audiences: government and its agencies, private industry and universities. The approach used last year involved seminars, workshops, publications and making OCRS staff available for consultation and information.

Full details of the program are given in a booklet entitled, *The Comprehensive Program of Remote Sensing Technology Transfer at the OCRS: A Unique Approach.*

Airborne Thermal Scanning Helps Save Energy

As a contribution to a major Ontario Ministry of Energy program on energy conservation, the OCRS gathered information during 1980-81 on heat loss from buildings in ten Ontario cities by using a thermal infra-red scanner.

Aerial thermography (the detection of heat energy by using a scanner carried on an aircraft) can also be used to monitor heat generated by leaks from sanitary landfill sites; as a means of checking for sources of water pollution; and to pinpoint areas which are prone to frost formation, as an aid to reforestation.

OCRS staff also contributed to the operation of community residential heat-loss clinics operated by the Ministry of Energy.

Providing Access to Ontario's Resources

In 1980-81, the Ministry managed four joint programs designed to provide better access to resource-rich areas of Ontario. Forest and mineral resources often exist in remote and undeveloped areas.

It takes resourcefulness, careful planning, good management, co-operation and a lot of money to enable resources users to get into hitherto remote areas.

The four joint programs enabled the Ministry to help in the building and the maintenance of roads and bridges to and from productive resource locations. The access programs were:

- The Resource Access Program (funded jointly by this Ministry and the Ministry of Northern Affairs);
- The Northern Ontario Resources Transportation Program (funded by MNA);
- The Forest Management Subsidiary Agreement Program (financed jointly by the federal and provincial governments and private industry); and
- The Ministry of Natural Resources' Forest Management Agreement Program (consisting of contractual agreements between MNR and certain forest product companies).

During the last fiscal year these programs funded the construction in the province of 685 km (428 mi.) of roads and six bridges, as well as the maintenance of well over 9,000 km (5,625 mi.) of roads (which is more than the distance between St. John's and Victoria, *and* back to Calgary!).

Resource Exploration Licences Being Negotiated for Hudson Bay Lowland Tract

Negotiations were completed last year with four companies and mineral exploratory licences of occupation were issued for a vast tract of northern Ontario. The area to be explored covers some 566,561 hectares (1.4 million acres) in the Hudson Bay lowlands, and the companies will be searching primarily for lignite, which is a low-grade form of coal.

The companies also suspect that peat and many other minerals, including diamonds, may be found in the huge territory.

Conservation Authorities Emphasize Water Management

MNR works with Conservation Authorities in various ways to control waters in all areas of the province. Structures, such as this flood plain drop control (left) and bank stabilization project (right) are often necessary to keep waters from flooding urban areas or eroding the banks of swift streams.

During 1980-81, the Ministry worked closely with the 39 Conservation Authorities in the province to make substantial progress on water and related land management projects.

Last year's program had a strong water management thrust, with almost $26 million of the more than $35 million in grants to Conservation Authorities going toward such projects.

The funded projects included floodplain mapping, dam construction, channel improvements, erosion protection, water quality monitoring and environmental assessment.

The Conservation Authorities are responsible for most watersheds in southern Ontario, and for watersheds in parts of northern Ontario near North Bay, Timmins, Sault Ste. Marie, Sudbury and Thunder Bay.

The Ministry is responsible for the development of policies and planning systems for the Authorities. In addition, the Ministry has a number of direct water management responsibilities throughout the province.

The Ministry provides financial, technical and operational assistance to the Authorities.

A Conservation Authority represents a provincial-municipal partnership. The membership of each Authority includes representatives from all municipalities situated wholly or partially within the watershed, plus up to three members appointed by the province.

Boundaries of most Authorities are defined on a single watershed basis such as the Grand River system, although some are on a number of small and adjacent watersheds, such as the Cataraqui Region.

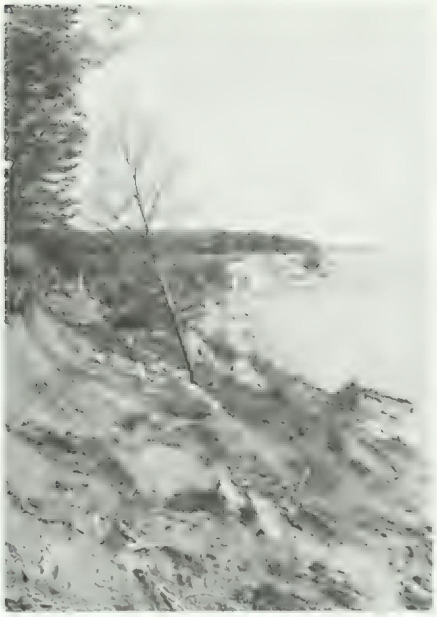
Each Authority undertakes a wide variety of programs to encourage the conservation, restoration, development and management of the renewable natural resources of their watersheds.

Flood prevention and control, and related water management, is the top priority. But managing forestlands, preserving wildlife habitat and conservation education are also important programs.

Probably the most visible program to the public is the provision of recreational opportunities—camping, boating, swimming, etc.—in Conservation Areas. Usually the waters and lands so employed have been acquired and developed as components of the Authorities' flood control and water management activities. The recreational use of these areas occurs as a beneficial by-product of these water management projects.

A good example of the co-ordinated operations of the Ministry and a Conservation Authority was seen in the Town of Port Hope last year. The town suffered serious losses when the Ganaraska River flooded in early 1980. The floods affected

Working for a Naturally Productive Environment



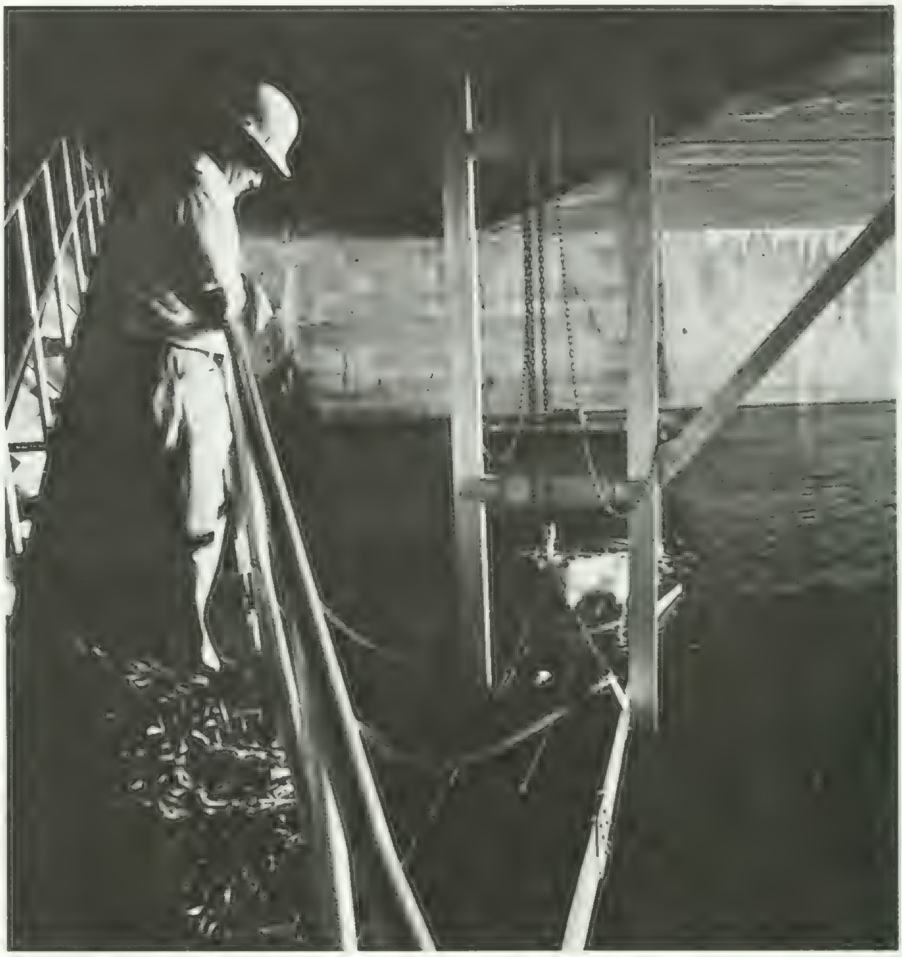
Erosion along Great Lakes' shorelines is a major problem. Special MNR programs keep shoreline residents informed of erosion hazards and help them to cope with erosion problems.

a significant portion of the town's central business district, wiping out or heavily damaging homes, commercial enterprises and various historic buildings.

To guard against a repetition of this disaster, the Ganaraska Region Conservation Authority used Ministry grants to purchase several properties along the river. The Authority intends to construct a major flood control channel through the town, and to manage the balance of the flood plain in this area so that such a disaster will not be repeated.

New Authority Formed for Kawartha Region

During 1980, the inaugural meeting was held of the the recently formed Kawartha Region Conservation Authority. MNR staff are presently working with the Authority to develop a watershed plan and a long-term program for the area.



New eel ladder at Moses-Saunders dam near Cornwall allows Atlantic eels to travel up 100-foot face of dam enroute to spawning grounds in Lake Ontario.

The Ministry designed and constructed a new eel ladder for the Moses-Saunders dam near Cornwall last year. The new ladder will not only make life easier for thousands of Atlantic eels, but will also help to support the efforts of hundreds of Atlantic fishermen who fish for eels in the Gulf of St. Lawrence.

The Moses-Saunders dam was constructed in the 1960s as part of the St. Lawrence Seaway. The dam would have prevented thousands of eels from making their yearly migration from the Atlantic Ocean to spawn in Lake Ontario, so a temporary wooden ladder was built in 1974. Time and traffic eventually took their toll on the ladder, however, and it became evident that a new one was needed.

The newly designed ladder is a series of ramps which zigzag up the face of the dam. As water trickles over the ladder, the eels negotiate the ramps, actually climbing the 100-foot face of the dam in about 15 minutes. After taking this man-made detour, the eels continue to their Lake Ontario destination.

The unique ladder is one of the largest in the world, and will be something of an attraction for naturalists and resources managers alike.

Other design and construction projects completed during 1980-81 included: construction of the Julian Reed Fishladder at Norval and the Reid Milling Dam Fishladder and Lamprey Barrier in Streetsville; the reconstruction of the Prairie Bee Dam, dams on Fara Creek, and on North Creek at the Dryden Tree Nursery; construction of a bridge over the Wenebegon River; and erection of a header house and two greenhouses at the Orono Tree Nursery.

Keeping the Public Informed

Ministry cartographer produces topographical map. Ontario Basic Mapping Program, begun in 1980-81, will be completed in 13 years.

Part of the Ministry's water management activities during 1980-81 included an active public awareness program about the potential hazards associated with the Great Lakes shoreline.

The great beauty of the shoreline can often be damaged by flooding, erosion, high waves and strong currents. These problems can be costly to property owners.

The Ministry's water management staff have put considerable effort into informing the public about these hazards and how to cope with them.

The information program involved sending letters to the 35,000 shoreline residents, outlining information available from Ministry staff and elsewhere.

In addition, slide-tape shows on shoreline hazards were prepared and shown at various public meetings throughout shoreline areas. These shows were also made available to other government agencies for general distribution and use.

1980-81 Lands and Waters Program Highlights

- Through MNR's resource access programs, 685 kilometres (428 miles) of roads and six bridges were constructed, and more than 9,000 kilometres (5,625 miles) of roads were maintained.
- Over 36,000 mining claims were recorded, more than double the number of claims registered in the previous year.
- The Ontario Basic Mapping program produced almost 300 medium-scale maps of northern and southern Ontario and more than 400 large-scale maps of 46 Ontario communities.
- The Ministry released draft land use plans to the public covering the province's three strategic planning areas: northeastern, northwestern and southern Ontario.
- The Ontario Centre for Remote Sensing produced a total of 19 scientific papers and reports.
- In co-operation with municipalities, the federal government and other ministries, MNR helped the 39 Ontario Conservation Authorities to complete major flood and erosion control projects throughout the province, including Thunder Bay, Belleville and Chesterville.
- The first maps showing forest and vegetation types north of latitude 52° north were produced.

Outdoor Recreation Management

Parks Enjoyed by Millions of People—in Every Season

Parks and Recreational Areas

MNR encourages year-round use of parks. Miles of cross-country ski trails are maintained for outdoors enthusiasts in the winter.

MNR's 131 provincial parks throughout the province offer full range of outdoor enjoyment to young and old alike.

During 1980-81, Ontario's system of 131 provincial parks attracted 5.5 million summer and winter visitors from Ontario and neighboring provinces and states. This was an increase of almost 50,000 from the previous year. Spending anywhere from a day to a number of weeks, campers, fishermen, canoeists, skiers and nature seekers enjoyed the resources of the woods, waters and terrain of our various parks.

However, last year the record number and size of forest fires in the north brought about a decrease in the number of out-of-province and U.S. campers. This factor, plus a 50¢ increase in camping fees and the jump in transportation costs, accounted for a decrease of 64,000 in the number of nights of camping in the parks.

Day use visits increased, however, by 110,000. An increase was also recorded in free group camping and day-use visitors from bus entries and annual permits.

The establishment of three new parks added 616 hectares (1,522 acres) of parkland to the 4,263,495 hectares (10,534,366 acres) already in the system. Two of the new parks are nature reserves—Schreiber Channel is in the North Central Region and Limestone Islands are in the Algonquin Region near Parry Sound. Peche Island in the Southwestern Region is classed as a recreation park.

Behind the scenes, hundreds of staff members set up and maintained the facilities and services necessary to make the visits enjoyable. Ministry programs of improvement constantly assure the upgrading and maintenance of the parklands.

Even with the large annual volume of visitors, however, our parks are by no means overpopulated. Revenues generated (more than $132 million last year) are important to the province's economy.

Thus, an active advertising promotion campaign for the parks system was planned for the 1981 season. A six per cent increase in attendance is the goal for 1981.

In 1980, the outright ban of alcohol from 20 parks from May 7 to June 1, and increased surveillance helped assure family campers of peace and quiet. The successful alcohol ban policy, first imposed in 1978, will be continued as long as the need exists.

Additional attention was paid last year to improving the snowmobile and cross-country ski trails operated by the Ministry. Trail clubs and conservation authorities were also given $500,000 in financial

Fishermen, canoeists, campers and boaters spend from a day to weeks in the parks system. Last year, camping fees were reduced in 44 parks through introduction of honor system for collecting fees.

assistance by the Ministry to groom 15,861 kilometres (9,856 miles) of snowmobile trails and 1,920 kilometres (1,193 miles) of cross-country ski trails. Trans-provincial snowmobile trails are being developed for future public use.

Fee Break for Late-season Campers

Campers taking in the splendid scenery last fall were offered reduced rates at 44 provincial parks during late September and on into October.

As an efficiency measure, the campers were asked to self-register and deposit permits and fees in special collection boxes. Therefore, no gate staff was necessary.

Reduced rates were $3 for a regular campsite and $4 for sites with electricity. Thirteen other parks were still in full service during this period charging normal fees of $5.50, $6 and $7.50.

Reduced rates were also offered in some parks on weekdays during the full camping season.

The Ministry also encourages day use of the parks even after the campsite operating season is over, stressing that the parks can be enjoyed on foot all year round.

Helping to Improve Municipal Parks

Last year, under The Parks Assistance Act, 34 municipalities throughout the province received grants totalling $556,000 to maintain and improve their facilities or to purchase lands for park areas.

Most of these grants were in the $10,000 to $25,000 range, but some were as much as $50,000.

Putting the Sun Behind the Showers

Modern technology harnessed an old, old source of heat as four northern and six southern Ontario parks installed hot water systems fuelled by solar heat last year, for use in 1981.

At Rushing River and Kakabeka Falls provincial parks, the sun-heated water will provide visitors with hot showers. At Remi Lake and Chutes provincial parks, it will heat the water for the taps in the washrooms. Solar panels were also installed in parks at Carillon, Balsam Lake, Darlington, McRae Point, Long Point and the Mew Lake Campground in Algonquin Park.

Each solar power installation will supply 55 to 65 per cent of the entire hot water requirements of the parks. The program is part of a movement to encourage use of sun-power as an alternate energy source by both private and other sectors of the population.

The projects are a joint program of the Ministries of Natural Resources, Energy and Northern Affairs.

New Park for Paddlers

Canoeists, fishermen and kayakers will soon be able to enjoy the first waterway provincial park in southern Ontario. Last year, plans were under way to establish Madawaska Waterway Provincial Park along a 46 km (28.5 mi.) stretch of the Madawaska River between McPhee Bay. and the Village of Griffith, about 50 km (31 mi.) northeast of Bancroft.

This is a magnificent stretch of river that has been used as a training area by the Canadian Olympic team and is also a popular area for day and overnight canoe trippers.

The lower portion of the proposed park offers an exciting variety of water conditions: waterfalls, shoots and a series of rapids. Nature explorers will find orchid species in the most northern limits of their range and can view cross-sections of a diverse geologic landscape.

Park facilities will be minimal to keep the natural character of the environment. However, two small campgrounds are in planning stages.

1980-81 Parks Program Highlights

- Three new parks were added to the provincial system, bringing the total to 131.
- Lands included in the park system now total 4.2 million hectares (10.5 million acres). The three new parks added 616 hectares (1,522 acres).
- During the winter months, 1,933 kilometres (1,201 miles) of snowmobile trails and 400 kilometres (248 miles) of cross-country ski trails were maintained on Crown land.
- For canoe trippers, 107 canoe routes and 21 provincial canoe areas were managed.
- Under The Parks Assistance Act, 34 municipalities received grants totalling $556,000 for park maintenance and improvement.
- To assure park users of healthy and safe visits, 2,000 drinking water samples, 3,000 swimming beach samples, 35 park sanitation audits and six park sanitation seminars were undertaken.

Major Revision of Game Licensing Allows Herds to Increase

Wildlife

Last year, taking of antlerless deer was restricted for first time in 30 years. Through new deer management program, MNR should increase deer herds by 25 per cent within 10 years.

Combined Big-game Licenses Eliminated

In June, 1980, the Ministry introduced the first major revision of the hunting licence structure in 10 years. This step was designed to allow greater control of moose and deer harvests, while at the same time providing hunters with opportunities to continue hunting big game.

The most significant change in licensing was the elimination of bear from the combined licences formerly issued for deer or moose. Bear licences are now purchased separately. This move enables the Ministry to collect more accurate data, needed for the improvement of big game management in the province.

Special Tag Required for Deer

Deer herds had declined substantially during the last 15 years in parts of central and northern Ontario. Increasing numbers of hunters were unsuccessful.

Consequently, a selective harvest system was introduced in fall, 1980, as a major part of the new deer management program.

When the deer season opened, the taking of antlerless deer was restricted for the first time in nearly 30 years. As a result, in the fall, 1980 hunt, 6,000 fewer antlerless deer were taken than in 1979.

Antlerless deer could be taken only by Ontario residents, provided they applied to the Ministry for a validation tag for this purpose and attached it to their basic licence.

The selective harvest approach is looked on as the only way to control the annual taking of deer in a predictable manner, and to allow the herds to increase through the protection of fawns and breeding females.

Ministry projections indicate that with modern management techniques, within ten years there should be a 25 per cent increase in deer in Ontario.

During the spring of 1980, MNR staff took the first deer population inventory since 1974, to provide the Ministry with a reliable estimate against which to measure results of the new deer management program.

Other measures were also being taken to improve and standardize the procedure for the collection of data about the number of deer taken and the status of their habitat each year.

Hunting Opportunities Increase in Southern Ontario

In agricultural southern Ontario, where in contrast, the number of deer has increased, controlled hunting zones were extended from seven in 1979 to 21 in 1980 to allow greater hunting opportunities.

Shotgun and/or muzzle-loading firearms seasons, with controlled hunter numbers, were held in the 21 areas. Approximately 5,650 hunters were authorized to hunt and they took about 1,000 deer.

Deer Management Priorities

Other important parts of the deer management program were:

- Extensive management of winter range to ensure that herds are not deprived of foodstuff;
- Including habitat consideration as an important element in forest management, following principles developed through Strategic Land Use Planning (SLUP) for multiple use of land;
- Effective control measures to be exercised in areas where there was a heavy predator toll; and a high priority on law enforcement to reduce the illegal killing of deer.

The support of this program shown by an overwhelming number of experienced hunters was most encouraging.

Moose Management Policy Approved by Cabinet

MNR's new moose management policy is designed to double the number of moose in the province to a total of 160,000 by the year 2000.

A moose management policy, which was developed in 1979-80 through extensive public participation at 72 meetings held throughout Ontario, and discussions with members of interest groups, was approved by Cabinet in October, 1980.

The Northwestern, North Central and Northern regions of Ontario in particular have seen declining moose populations for the same reason deer herds have declined—overhunting, poaching, animal predators and deterioration of the habitat.

The shortened seasons and the increased licence fees to non-residents, which were introduced in 1975, were not enough to halt the decline of moose. Herds had dwindled from 125,000 animals in 1968, to a present 80,000, representing a decrease of 35 per cent.

The new, comprehensive policy, designed to increase the moose population, covers broad objectives of moose management including: controlling the harvest of moose by limiting licences through a lottery draw; controlling hunter access; predator control; enforcement; habitat management; resource allocation; research; mandatory registration and reporting; and hunter education.

The MNR objective is to double the present herd—to 160,000 in the next 20 years.

The Ministry plans to have the entire policy and program in place in three to four years.

Moose Harvest Reduced by 28 Per Cent Last Fall

As intended, the number of moose taken in the fall 1980 hunt was reduced from the 1979 number by 28 per cent—8,361 moose compared to 11,690 the previous year.

Two or three hunters were required to share a moose in the fall, 1980, hunting season in a measure to reduce the harvest. A drastic shortening of seasons, combined with generally poor hunting conditions across the province, also helped to account for the reduction.

Bill 59— Major Wildlife Resource Revision to the Game and Fish Act

Precise management of our wildlife resource is provided for in Bill 59, an Act to amend The Game and Fish Act, which received Royal Assent on November 14, 1980.

Amendment of the Act reflects the increasing interest by all Ontario residents in protecting wildlife resources. In particular, the many concerns of naturalists, humane associations and animal welfare groups will be more adequately served by the additions to the statute.

A few of the major changes provided for were:

- Separate classification for elk in order to give that animal specific protection;
- Additional controls necessary for the preservation and use of deer and moose, and mandatory reporting of hunter success;
- Protection of reptiles and amphibians to ensure that scientific and commercial use does not lead to them becoming threatened or endangered species in Ontario;
- Bringing the maximum fines for infractions under The Game and Fish Act from $1,000 to $5,000;
- Provisions to control the use and possession of traps;
- Provisions concerning the training of hunting dogs and field trials held outside the normal hunting season.

Black Bear Study In Wrap-up Phase

Consider the mother black bear—where would her cubs be without her? She alone raises the cubs from infancy to subadult with no help from the male and, in fact, may have to defend her young from a threatening male.

These, and many previously unknown facts about black bear have been gleaned from a long-term study of bears in an area northeast of North Bay. The project is to be completed by the end of 1981. When the MNR study was begun in

1969, little detail was recorded about the black bear or, indeed, about any bears anywhere. Use of radio devices to track 125 bears throughout the area proved invaluable and contributed considerably to the progress of the study.

Researchers learned that black bears reproduce much more slowly than previously thought. The earliest age of giving birth for the females under surveillance was 5½ years. Since the mother tends the cubs for at least a year and a half, she doesn't mate again until the second year. She usually has two or three cubs. Females are about half the size of males—grown males weigh in at about 300 pounds.

Tracking the bears through the bush both physically and by radio, scientists discovered that they spend most of their waking time foraging for food. Black bears are not carnivorous but they seek out any high energy food—hence their attraction to human-made garbage.

In the spring they eat poplar leaves, catkins, grasses and sedges. They switch to berries in summer and make meals of ants, wasps and bees as well. Angry wasps deter them not. They break open nests and feed at leisure.

Male black bears are great wanderers, they've been tracked over large distances. At night, they simply sleep where they are. Females with cubs have dens, though they choose a sanctuary tree in the area to stow cubs for protection.

In the fall, the bears go on long-range foraging expeditions to load up on favorite foods prior to hibernation. When supplies are plentiful, they binge on acorns and hazelnuts. Winter dens are chosen carefully, usually a bear-size excavation is made at the base of a tree or stump and lined with leaves and grass.

Data produced and techniques of capture and control have already contributed to MNR's bear management program. Last year, material presented to regional workshops in the province was based on study information.

Tranquillized bear wears a radio-tracking collar which allows MNR wildlife scientists to learn details of bear's habits that will assist in management of this big-game animal.

Rabies Research Program Developing Rabies Vaccine

The Ministry rabies research program made encouraging progress during 1980-81. The program is working toward the development of an oral rabies vaccine that can immunize Ontario's wildlife against the disease.

The major thrust of the program last year was to continue vaccine development by university and private contractors. But the Ministry's scientists also did research into the most effective way of administering the vaccine—once it is developed—to wildlife populations.

The research has led to the conclusion that the best way of vaccinating Ontario's wildlife is by using hamburger meat balls as bait.

In two trial runs during 1980, some 60,000 tetracycline-treated baits were dropped by air over test areas near Wingham and Owen Sound. The tetracycline in the meat balls left traces on the animals' teeth. When the teeth were examined under an ultraviolet microscope, the traces of tetracycline were visible as golden-yellow lines, and the presence of these marks told the researchers that the animal took the Ministry's bait. The meat balls were dropped from low-flying aircraft in quantities of about 100 meat balls per square mile.

The researchers also worked on ways to improve the percentage of animals that respond. Foxes and skunks are the largest carriers of rabies in Ontario, and the tests so far have shown that about 74 per cent of the foxes and 56 per cent of the skunks responded to the bait.

Meanwhile, work on the development of a suitable rabies vaccine was progressing, and researchers anticipate that a field test using a rabies vaccine will be possible in the fall of 1982.

Sixteen Peregrine Falcons Released in Algonquin

A program for re-establishment of the peregrine falcon in Algonquin Park received an unexpected boost in the summer of 1980. Sixteen birds instead of the expected eight were supplied by the Canadian Wildlife Service from its captive breeding stock in Wainwright, Alberta.

The peregrine falcon, a small bird of prey, was placed on Ontario's endangered species list in 1977 when it was found that the species disappeared from Algonquin Park nesting sites. Re-establishment of this falcon became a priority goal of the Ministry in 1977.

During the first four years of the five-year program, 36 peregrine falcons were released in the park. Ministry biologists hope that the birds which survive will establish breeding populations.

Wild Orchid an Endangered Species

The small whorled pogonia, a type of wild orchid, was placed under the protection of The Endangered Species Act in April, 1980. This orchid is known to occur in Canada at only one location in Southwestern Ontario.

Two plants were present in 1980, down from five observed in 1978 and 1979, and four in 1977, when the species was first discovered in Ontario.

The small whorled pogonia is seriously depleted throughout its entire eastern North American range.

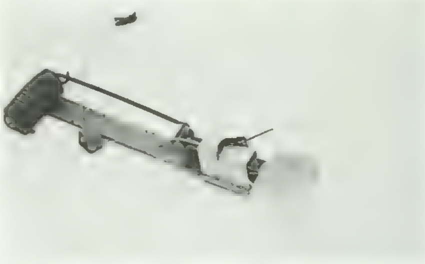
This brings to 14 the total number of species protected under Ontario's Endangered Species Act. Including the small whorled pogonia, they are: small white lady's-slipper orchid, blue racer, piping plover, white pelican, Kirtland's warbler, Eskimo curlew, golden eagle, peregrine falcon, bald eagle, West Virginia white butterfly, Lake Erie water-snake, timber rattlesnake and eastern cougar.

New Program for Trapping on Private Lands

Trapper sets the new humane foot-snare trap developed by MNR. The snare lock and cable hold animal's leg firmly without inflicting pain and injury.

A program for administering trapping on private lands was approved in January, 1981. It is expected that the program will be fully implemented by the 1984-85 trapping season.

The 87 per cent of Ontario which is Crown land is now divided into registered traplines. The remaining land, which is privately owned, will now be divided into private land fur management areas. The Ministry worked for over a year with members of the Ontario Trappers Association to find the best approach to provide and control orderly trapping with the land-owners' consent. Each fur management area will be allocated a specified number of trappers depending on the fur resources within the unit. The system will enable the Ministry to collect more accurate management data and will alleviate problems of over-harvesting, excessive numbers of trappers and competition between trappers. It will also help the Ministry realize a greater economic return for the commercial resource on private land.



New Foot Snare Trap in Production

The humane foot-snare trap, developed by Ministry wildlife staff in 1979, is being patented throughout the world and was in production in Ontario during 1980. It is expected to be on the market during 1981.

The production trap was developed through 18 prototypes by Milan Novak of The Ministry's Wildlife Branch. The trap has an action similar to that of a lasso. Gently conforming to the shape of the animal's leg, the snare lock and cable hold the leg firmly without inflicting pain and injury.

Instructor lectures class of new trappers as part of MNR's mandatory trapper program.

Models shown at trapper education courses received very favorable response. The number of trap-related injuries to species like fox and coyote will be greatly reduced by the use of the foot-snare trap.

Course for Trappers Introduced

In July, 1980, the Ministry introduced a mandatory trapper education program in three southern regions, through the Ontario community college system. In July, 1981, the Fur Harvest, Fur Management and Conservation course became mandatory throughout the province.

The course, in the development stage since 1972, is designed to upgrade the skills of fur trappers and improve their methods of pelt handling and marketing.

The program deals with the biology and management of furbearers and pelt preparation as well as the survival skills the trapper has to have. Humane trapping is stressed throughout.

Over 30 trapper education courses were attended by 750 new and experienced trappers in this fiscal year, and 25 more instructors were trained in September to help fill the demand.

The number of trappers in Ontario has grown to almost 18,000 from 8,463 in 1970, and over 87 per cent of Ontario is divided into registered traplines. The rest is now being divided into the private lands fur management areas.

The value of all pelts taken during the last year for which figures are available—the 1979-80 harvest—was $24,407,054. The meat from these furbearers was worth an additional $8 million.

1980-81 Wildlife Program Highlights

- Resident and non-resident hunters of big and small game accounted for 4.8 million hunting days.*
- The passage of Bill 59 in November, 1980, provided the first major revision to the province's wildlife management laws in 10 years.
- A Ministry moose management plan designed to ensure the well-being and double the number of the province's 80,000 moose was approved.
- The inclusion of the small whorled pogonia, a type of wild orchid, brought to 14 the number of species protected under The Endangered Species Act.
- A new deer management program was implemented to increase the number of deer in the province by 25 per cent within ten years.

* A figure based on data gathered in 1979-80, and projected for 1980-81.

New Strategy for More and Better Fish

Fisheries

Nature was generous in bestowing over a quarter of a million lakes and countless miles of rivers and streams on Ontario, and it compounded the gift by adding 140 species of fish to the waters.

Last year, three million residents and 700,000 non-residents went angling for the bounty of these waters and added millions of dollars to our economy. Commercial fishermen also harvested $23.6 million worth during 1980.

But our fish populations have been under stress for years. Some areas are almost fished out, streams and lakes are debilitated and degraded and poisons and pollutants from many sources are affecting the fish in many water bodies.

Concern over the deteriorating status of our fish stocks brought about, in 1979, a new management strategy for the province's fisheries. The new program, the Strategic Plan for Ontario Fisheries (SPOF), was developed by a federal-provincial task force.

SPOF is committed to the maintenance and protection of healthy fishery resources in the province and to the rehabilitation of those waters which have become degraded.

Last year's Fisheries program emphasized these areas:

- Rehabilitation of degraded fish populations and habitats;
- Improvement of public awareness of fish resources and environment;
- Development of a computerized management information system, and
- Assessment of fish culture capabilities and recommendation of new sites for fish culture facilities.

To improve some streams last year, silt and other debris were dislodged by using fire hoses on existing spawning beds. In other places, boulders and gravel were added to streams to create the spawning areas. This was done for walleye spawning grounds, for example, in streams entering Lake of the Woods and Eagle Lake.

In some areas, surveys were undertaken to see if spawning grounds could be created for both walleye and lake trout. Walleye were also transplanted from one area to another to re-establish that species in waters from which it had all but disappeared.

Work was begun in 1980 on the construction of the Hill's Lake Hatchery. It will be one of the most modern major brood stock hatcheries in the world, when completed in the fall of 1981.

Brood stock at Hill's Lake will produce five million eggs annually. Improvements were started on other hatcheries in the northern portion of the province last year as well.

A major study was completed last year on the needs and development options of the Ontario Fisheries Information System (OFIS). This is a computer-based system to provide information for fisheries management. Implementation of this program is expected to begin in 1981-82 and will include computer equipment in fisheries units throughout the province for local data analysis and a central data archive which would be accessible to all units.

The Ministry intends to preserve and enhance the fisheries of northern Ontario and restore degraded fisheries in the southern part of the province. With last year's accomplishments, this multi-year program is well-launched.

Who, What, Where and How of Ontario's Anglers

To produce a profile of the impact of sport fishing on the province's economy and the fishing environment, a questionnaire was sent out early in 1981 to both residents and non-residents of Ontario. Names of 7,500 non-residents were selected from 1980 Ontario angling licence holders and 40,000 residents' names were chosen at random. Not all the Ontario residents are anglers, so the sampling will have a cross-section of unbiased results.

The survey was a joint MNR-federal Department of Fisheries and Oceans

MNR fisheries technician gets firm hold on a burbot (freshwater member of cod family). Experts study fish and their habitat to ensure the province's fish supply.

Conservation Officers not only patrol fishing areas to enforce regulations, but also offer friendly advice.

project and will update a previous survey taken in 1975.

Questionnaires asked for details on places fished, fish taken and fish preferences. Information on equipment rentals or purchases, accommodation and other expenditures was also sought.

Results of the survey will be used to produce statistics for several reports, including summaries for MNR fisheries staff in the field.

Lake Trout: The Fight to Preserve a Fragile Fish

Last year, 400,000 yearling lake trout were planted in Lake Ontario by MNR as part of a program begun in 1976 to reintroduce the species following complete extinction in this lake in the 1950s.

The first encouraging results of this program came to light in the fall of 1980, when mature female lake trout weighing about five pounds were taken from a potential spawning area near Clarkson. The females were in a spawning condition and fisheries biologists will continue to monitor the progress of the trout carefully over the next few years.

Native lake trout have entirely vanished from not just Lake Ontario, but from over 100 other lakes in the province over the past 30 years.

Man, by changing and polluting aquatic environments, has put the slow-growing lake trout at risk.

Lake trout need six to eight years to mature and females don't necessarily spawn every year. They also produce relatively few eggs, compared to most other species. The eggs need four to six months to hatch and the fish need a clean, high-oxygen, low-vegetation habitat.

Some of the methods in use to save the trout in certain areas and preserve the status quo in others are re-establishing lake trout habitats, controlling effluents and pollutants, and regulating fishing. Control of the lake trout predator, the sea lamprey, in Lake Ontario has also contributed to improving conditions for the fish in that lake.

Fisheries researchers are also looking for other ways to stabilize or increase native populations.

For example, last year Lake Simcoe lake trout were transplanted to a northern sanctuary lake to see if they could thrive in the new environment without genetic change. If the transplant process is successful and healthy, genetically stable stock are the result, it may become possible to save other populations in the same way.

Adding Life to Our Waters

Conservation Officer makes creel count to ensure licensed fisherman is taking only allowable catch.

To replenish fish populations throughout the province, Ontario's 14 fish culture stations produced the 81,000 eggs and 7.5 million fish used to stock our waters. Most of these were released into 1,100 inland waters; 36 per cent went into the Great Lakes and their tributaries.

The majority of the fish stocked (about 83 per cent) were salmonids: lake trout, rainbow trout, brook trout, splake (an MNR-developed hybrid of brook and lake trout), coho and chinook salmon. Non-salmonids released were maskinonge (muskellunge), walleye and smallmouth bass. Where there are native communities of non-salmonid fish, stocking programs have met with limited success, so releases of these fish were for specific rehabilitation programs and research efforts.

When stocking fish, managers take into consideration public demand and the natural supply and accessibility of fishing waters, among other things. Information from periodic questionnaires and locality angler and resident interviews establishes angling activity and whether the fish supply is adequate. Because fish are stocked for the benefit of all Ontarians, the bodies of water considered must be available to all members of the public.

How We Built a Better Trout

Splake registered its first success with anglers during the 1980 season. An improved hybrid, which was developed by Ministry scientists, was stocked in Georgian Bay in 1979 and provided good catches last year.

The so-called backcross splake was created by cross-breeding a female lake trout with a highly selected sixth generation splake. The result was a good angling fish that grows up to 15 pounds and marries the deep swimming ability of the lake trout with the fast maturing quality of the brook trout.

Splake were bred with qualities that made them able to overcome the lamprey depredations that once devastated Ontario's lake trout. This, along with their fast growth and hardiness, led to the program to stock them in Lake Huron to replace the depleted lake trout. First generation splake were also introduced into several northern lakes.

The Georgian Bay catches delighted fishermen and scientists alike. The success pointed to an even richer future. So popular was the fish with both anglers and commercial fishermen, that catches had to be curtailed in the early winter of 1980 to ensure that enough fish reached maturity to provide spawning stock. During that time, the Ministry also monitored potential spawning grounds to record spawning activity.

Farm-fresh Trout for Sale

Fish farming—or commercial fish culture—is a growing industry that has spurted in the province in the last five years. Last year, about 80 licensed fish

Tuning In on Fish and Wildlife

Ministry scientists take samples of lake waters so they can be tested for contaminants such as acid rain. They are then able to assess potential danger to fish and to the minute plant and animal materials that fish feed on.

farms produced more than $3 million worth of fish: mostly rainbow or brook trout.

Nearly all of these found their way to restaurant tables or stocked recreational waters. Fish farms which grow fish from egg or fingerling stages in earthen or concrete ponds can produce a standard eight to 10 ounce fish on a year-round basis.

In an effort to further encourage commercial fish culture, the Ministry appointed a Fish Culture Extension Biologist last year to review existing legislation and policies, and to provide technical and informational assistance to the industry and interested groups.

Work was initiated on a Fish Culture Handbook during 1980, in a joint project with the Ministry of Agriculture and Food. This Ministry is also involved in the co-ordination of MNR and OMAF fish culture research efforts and services to industry.

Ontario licences for commercial fish culture are limited to four species: rainbow and brook trout, small and largemouth bass. In future, it may be feasible to extend licences to farm other fish.

Acid Rain and Fish

Studies are under way in the Ministry of Natural Resources and the Ministry of the Environment to look into the effects of acid rain on our resources. Fisheries researchers are eager to find countermeasures to combat this contamination, but must study the specific impact on individual species before solutions may be advanced.

At the Harkness Laboratory in Algonquin Park last year, investigations into acid stress on lake trout, brook trout and whitefish continued, and a new study was begun on the early life stages of lake whitefish.

Researchers also studied the way acid rain affects the tiny floating animate sources of fish food—the zooplankton—to understand the impact this may have on fish communities.

A joint experimental project to evaluate the effectiveness of adding lime to lakes was undertaken last year with the Ministry of the Environment.

In other co-operative projects in 1980, approximately 7,500 fish samples were collected from 200 different waterbodies by MNR staff for testing by the Ministry of the Environment.

In addition, the analysis of 1,200 water samples from 1,000 sites across Ontario was completed in 1980 to determine the ability of these waterbodies to buffer acid rain.

Radio tracking of wildlife—such as bears and wolves—has been practised for over 20 years, so it's no news to the Ministry's wildlife research scientists.

But it is news to track fish.

Researchers working for the Ministry carried out tests last year on the behavior of lake trout in Lake Opeongo, in Algonquin Park.

The study used sonar transmitting devices (about the shape and size of a tube of lipstick) which were sewn to the fish, and which enabled the researchers to track the fish as they travelled around the lake.

The scientists were interested in discovering the general pattern of movement of the lake trout as they spawned, and the sonar devices provided them with some surprising information.

Before the study, scientists had thought that the fish returned to their favorite spawning beds every year, much like the Pacific salmon in British Columbia. The devices showed, however, that the fish move haphazardly from spawning bed to spawning bed—beds which might be anywhere from a few feet to three miles apart.

The sonar devices also allowed Ministry researchers to discover that fish behave differently depending on their sex and age. The most mobile were the older females; young males moved around the least. The scientists suspect that it is the older females who decide where the location of spawning grounds will be, and that the males don't have much to say about it.

Staff at the Ministry's Maple wildlife research unit began working on a device that will miniaturize the current sonar devices used on fish. The devices in use at present are suitable with fish which are five pounds or more. The new device should be usable with much smaller fish.

Small is Good for Wildlife Tracking

The tiny fish "tracking" device was developed from a miniature unit designed for animals.

Early (and bulky) radio tracking collars have certainly helped in wildlife management, but they could only tell researchers *where* an animal was.

Our researchers last year pioneered a revolutionary miniature tracking device that can tell wildlife scientists not only where an animal is located, but also the temperature of its den, whether or not it is still alive, whether it is moving, and potentially much more.

The big increase in information was made possible by incorporating developments in the field of micro-chip circuitry with wildlife tagging.

The tracking devices developed and produced by our scientists are the smallest ever made, and can provide the most information. The size of the device allows the researchers to gather data without interfering significantly with the animal's natural behavior.

Volunteers Added to Enforcement Staff

The need to increase our enforcement capabilities led to the establishment of a Deputy Conservation Officer Program in the spring of 1981. This was in response to increasing desire by members of the public interested in the outdoors to become active participants in the enforcement of fishing and hunting regulations. All deputy conservation officers are volunteers trained in enforcement techniques before being appointed in their roles by the Minister of Natural Resources.

Deputies perform the same basic functions as regular conservation officers—management and enforcement. Up to March 31, almost 200 deputies had been trained and were ready to assist in enforcement during the fish run and the upcoming hunting season.

1980-81 Fisheries Program Highlights

- MNR fish hatcheries produced the 7,589,585 fish and 81,000 eggs stocked into Ontario waters during the year.
- Resident and non-resident anglers caught and retained more than 90 million fish.
- An expenditure in excess of $500,000 was made to repair damaged fish habitats.
- A total of 7,500 fish from 200 waters were collected by MNR and tested for potential chemical contamination in Ontario Ministry of the Environment laboratories.
- In another test, 1,200 water samples from 1,000 sites were analysed to determine ability to buffer acid rain.

Ministry Staff

Ministry Develops Energy Five-Year Action Plan

Administration

The Ontario Government is committed to increase the level of energy self-sufficiency in the province by 12 per cent by 1995.

To focus MNR's contribution to this commitment, an internal Energy Task Force developed a five-year Energy Action Plan, now in the process of being implemented.

The Action Plan features a number of MNR/Energy Ontario projects (managed by Natural Resources staff and funded by the Ministry of Energy and other provincial ministries).

One such project—already mentioned on page 36 of this annual report—involves the installation of solar panels on the roofs of a number of comfort stations in certain provincial parks.

In another energy-related project, the Ministry funded the conversion of 51 pickup trucks in its fleet to operate on propane gas. The trucks, in use at nine MNR locations in the province, are used alongside conventional gasoline-powered vehicles.

A study is under way to determine how the propane-powered vehicles stack up against their conventional competition. Propane is about 40 cents a gallon cheaper than gasoline and burns more efficiently.

The test vehicles are equipped with 45 to 50-gallon liquid propane tanks. The propane is stored under pressure and pumped to the engine much like a gasoline-using vehicle. While the performance of the trucks is still being reviewed, the early reaction has been very good.

Last year, 51 MNR trucks were converted to operate on propane fuel as an energy conservation project.

Other energy-related projects initiated, include studies to evaluate the potential of uranium and peat as energy sources in the province, and the undertaking of the Ontario Householder Home Heating Survey. The survey is designed to determine and analyse the past, present and future of domestic fuelwood heating in Ontario with emphasis on rural areas of the province. The survey is a joint MNR/Energy Ontario project.

Total MNR Staff

March 31, 1981	Regular	Unclassified	Total
Main office	880	420	1300
Field offices	3502	1216	4718
Total	4382	1636	6018

Two Employees Awarded for Bravery

Premier William Davis congratulates MNR heroes Frank Hicks of Huntsville and Bob Grant of Kenora. Both men received Canada's Star of Courage last year.

Two Ministry employees received the Star of Courage during 1980. The award is the country's highest recognition for bravery, and is presented by the Governor-General of Canada only to those who perform the most conspicuous acts of bravery.

The employees, Frank Hicks and Bob Grant, both displayed incredible courage in rescuing three people in two separate incidents during the early spring of 1979.

Mr. Hicks is a biologist based in Huntsville, and Mr. Grant is a Ministry pilot at Kenora.

When snowmobilers fell through the thin ice on Baptiste Lake near Port Hope, Frank Hicks used a ladder and a canoe to get two of them to safety. His valiant rescue occurred in the dead of night, and the waters of the lake were icy cold.

Bob Grant, and commercial helicopter pilot Brian Clegg of Niagara Falls, rescued a passenger of a downed aircraft from the freezing waters of Lake of the Woods. Mr. Clegg piloted his helicopter in the foulest of weather while Bob Grant climbed out on the skid, straddled it, and lifted the woman from the water.

Mr. Grant remained on the skid holding her until the helicopter landed safely near a hospital. Mr. Clegg was also awarded the Star of Courage.

The quick thinking, resourcefulness and courage of Frank Hicks and Bob Grant were also recognized by awards from the Lieutenant-Governor, the Premier and this Ministry.

Administration Keeps the Ministry Going

Administration, put simply, is the combination of people, policies and procedures that keep the Ministry running smoothly.

The Ministry of Natural Resources' administrative structure is decentralized. Policies and targets are set at main office, where guidance and support are provided to the front-line or field staff scattered throughout the province. This decentralization allows the field staff to respond quickly and sensitively to local requirements. For administrative purposes, the Ministry staff and facilities are divided into eight Regions and 47 Districts.

A good test of the Ministry's administration came during 1980-81. The summer of 1980 was the worst forest fire season since 1923, with three months of intense fire activity in the Northwestern and North Central Regions of the province.

During the emergency periods occasioned by large fires such as Red Lake 14, Kenora 23, Ignace 27 and Thunder Bay 46—along with the hundreds of smaller fires breaking out at the same time—Ministry staff turned to dealing with fire-related problems first, and their regular tasks later. Not only did all MNR people in fire-affected areas go on full-time fire duty, but hundreds of staff from other parts of the province also joined them either to fight fires or to provide administrative support.

Although the Ministry was required to maintain only minimum services throughout the province during the fire emergency period, the fiscal year ended with most program objectives met or surpassed.

Senior Staff Changes

There were several important senior staff changes during 1980-81. Heading the list was the appointment of W. T. (Bill) Foster as Deputy Minister, replacing Dr. J. K.Reynolds, who retired in December. Mr. Foster assumed his new duties on January 1, 1981.

In addition, George McCormack was appointed as Assistant Deputy Minister for Northern Ontario; Don Johnston was appointed Regional Director, Northwestern Region; and Art Holder was appointed Director, Fisheries Branch.

Last year also saw the creation of two new positions—Provincial Fisheries Scientist (Ken Loftus), and Science Adviser and Research Co-ordinator (Dr. Martin Walmsley).

The total number of permanent Ministry staff was down to 4,382 on March 31, 1981, from 4,429 on the same date in 1980, primarily because of a reduction in main office positions. Field staff levels remained fairly constant through the year.

The continuing reorganization led last year to the consolidation of four district offices into two. The White River and Wawa district offices were combined into a larger district based in Wawa. During the year, the Ministry announced that the Lanark and Ottawa district offices were being combined into a new district, which will be based in and named Carleton Place. Both of these measures were introduced to achieve operating economies while making sure that effective service continues to be provided to the people of the areas.

Major Exhibit Featured Conservation Theme

Youngster reaches around her balloon string to stroke fisher pelt at MNR's popular exhibit at Sportsmen's Show last year. Exhibit attracted over 200,000 visitors.

The Ministry's exhibits program included major presentations at the Toronto Sportsmen's Show, Central Canada Exhibition, Canadian Lakehead Exhibition and the International Plowing Match near Aylmer.

The theme of the Sportsmen's Show exhibit—the major annual MNR display with an audience of more than 200,000—was devoted to conservation ideas in wildlife and fisheries management, as well as the Ministry's various energy conservation initiatives.

The Ministry also participated in the Ontario Government exhibit at Windsor, timed to coincide with the U.S. Republican Convention at Detroit. The majority of MNR districts did one or more displays or exhibits during the year, as did several program branches in main office, for an overall total of 59.

Management Improvement Plan Goes Into Final Year

Well into the third and final year of the Ministry's Management Improvement Plan (M.I.P.), the program made significant progress during 1980-81 towards reaching its broad objectives.

Among the plan's accomplishments last year was a reduction in main office staff by approximately 200 positions. This number actually exceeds the targeted figure of the plan by about 10 per cent.

Also under M.I.P., a Management Information System was developed to allow managers in main office and the field to obtain better data upon which to base their planning and managing of programs and services.

During 1980-81, a Communications Strategy for the Ministry was also developed, to more effectively communicate both to the public and to staff. Implementation was to begin during 1981.

The Management Improvement Plan also sponsored a series of management training seminars which were attended by all the Ministry's managers and supervisors—over 700 people. The training program was designed to improve the overall management of employee performance.

Affirmative Action Program Makes Gains

The long-term goal of the Affirmative Action Program is to have women represented in at least 30 per cent of all categories in the Ministry by the year 2000.

Because a great number of job categories in MNR have traditionally been filled exclusively by men, a concerted effort is being made to open up those areas in instances where women can perform on a par with male candidates.

A push is also on to train and upgrade women to managerial levels.

Last year, there were 18 targeted classifications for hiring or promoting women; areas where women were definitely under-represented. Overall, hirings or promotions during 1980 exceeded the targets, except for two priority areas. There was also an increase in hirings or promotions in non-targeted areas.

Growth was also seen last year in the number of women in professional and technical positions requiring resource management training—the number of resource technicians increased 41 per cent. Women's participation in technical services and administration improved as well.

To encourage increased upward mobility, short-term assignments with developmental potential were assigned. This involved 54 women in secondments, job rotations or acting appointments and facilitated competition for high-level positions.

Affirmative Action Committees composed of elected representatives from groups and regions met regularly during the year to learn developmental techniques. They, in turn, organized courses such as Assertiveness Training or Career Planning for MNR employees throughout the province. The Committees also acted as an Affirmative Action information resource.

An Affirmative Action Task Force composed of both men and women from several levels of staff completed a report last year which made recommendations for improving the program. The bi-monthly Affirmative Action newsletter was produced by six different regions and distributed through the Ministry. Through personal experience articles by women new to certain job categories, reportage on regional developments, comments and general articles, the newsletter presented a lively and candid picture of the program as it developed.

Much has been accomplished since the initiation of the Equal Opportunity Program (forerunner of Affirmative Action) in 1975. Last year, MNR hired its first female Conservation Officer, District Parks Supervisor, Pits and Quarries Inspector and Fire Prevention Officer—each a definite milestone for Affirmative Action.

Ministry of Natural Resources Statements of Budgetary Revenue and Expenditure for the Year Ended March 31, 1981

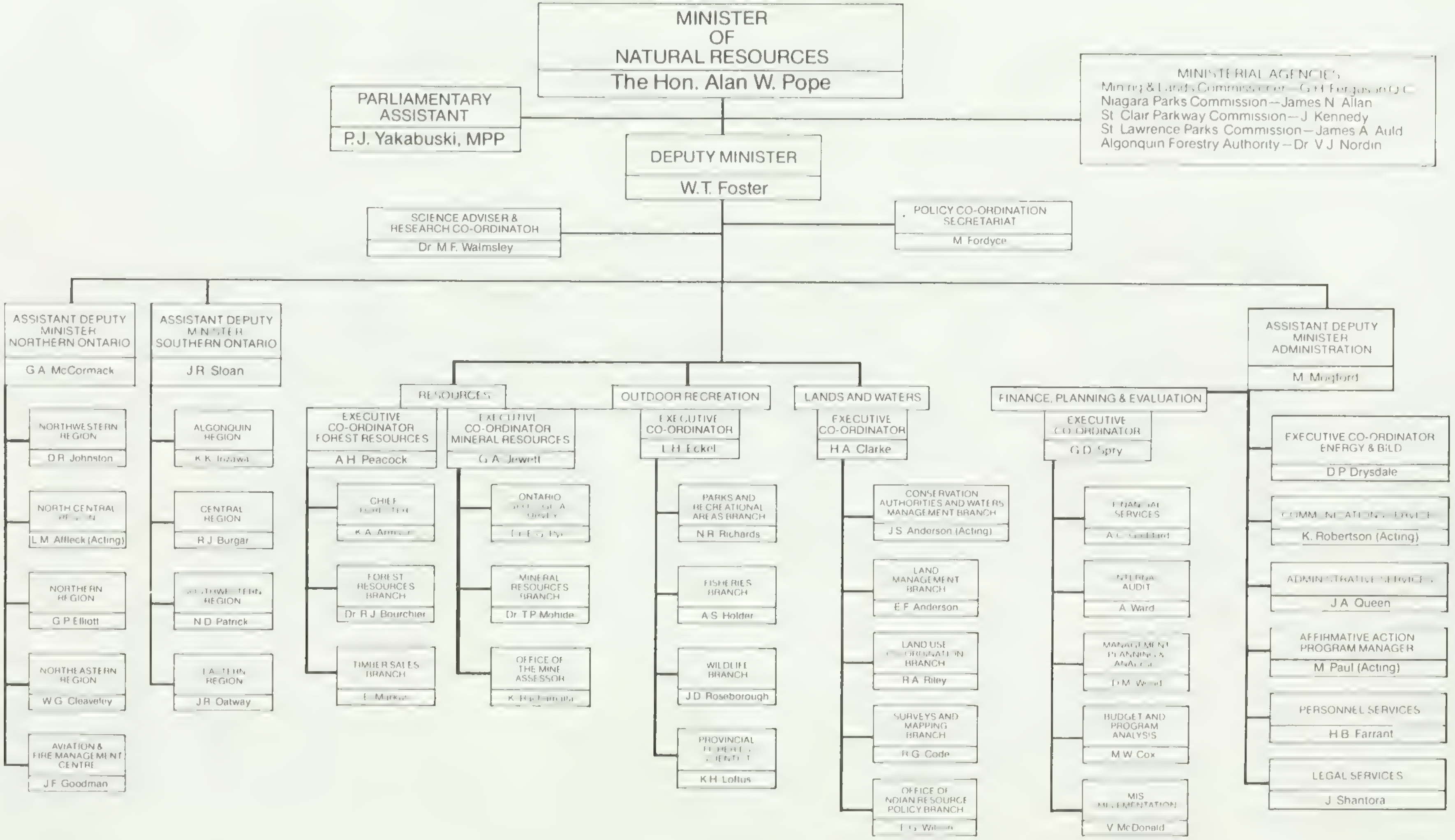
Ministry of Natural Resources Statement of Budgetary Revenue for the Year Ended March 31, 1981

Ministry Administration Program	**($thousands)**	**($thousands)**
Reimbursement of Expenditures		
Government of Canada	55	
Other	7	
Sales and Rentals	1,556	
Recovery of Prior Years' Expenditures	73	
Other	24	
Total for Ministry Administration		1,715
Land Management Program		
Royalties		
Water Power	19,159	
Timber Area Charges	4,401	
Mining		
Acreage Tax	590	
Fees and Licences	672	
Reimbursement of Expenditures		
Government of Canada	435	
Other	794	
Sales and Rentals	5,676	
Recovery of Prior Years' Expenditures	279	
Other	33	
Total for Land Management		32,039
Outdoor Recreation Program		
Reimbursement of Expenditures		
Government of Canada	2,719	
Other	55	
Recreational Areas	6,645	
Fish and Wildlife	14,308	
St. Lawrence Parks Commission	3,623	
Recovery of Prior Years' Expenditures	35	
Sales and Rentals	385	
Royalties	1,201	
Other	25	
Total for Outdoor Recreation		28,996
Resource Products Program		
Mineral Management		
Profits Tax	160,472	
Royalties	2,381	
Fees	306	
Forfeitures	1	
Recovery of Prior Years' Expenditures	13	
Sales and Rentals	848	
Forest Management		
Stumpage	47,267	
Forest Products	283	
Stock Production	609	
Reimbursement of Expenditures		
Government of Canada	2	
Other	14	
Recovery of Prior Years' Expenditures	1	
Sales and Rentals	242	
Royalties	77	
Total for Resource Products		212,516
Resource Experience Program		
Frost Centre Facilities	296	
Total for Resource Experience		296
Total Budgetary Revenue		275,562

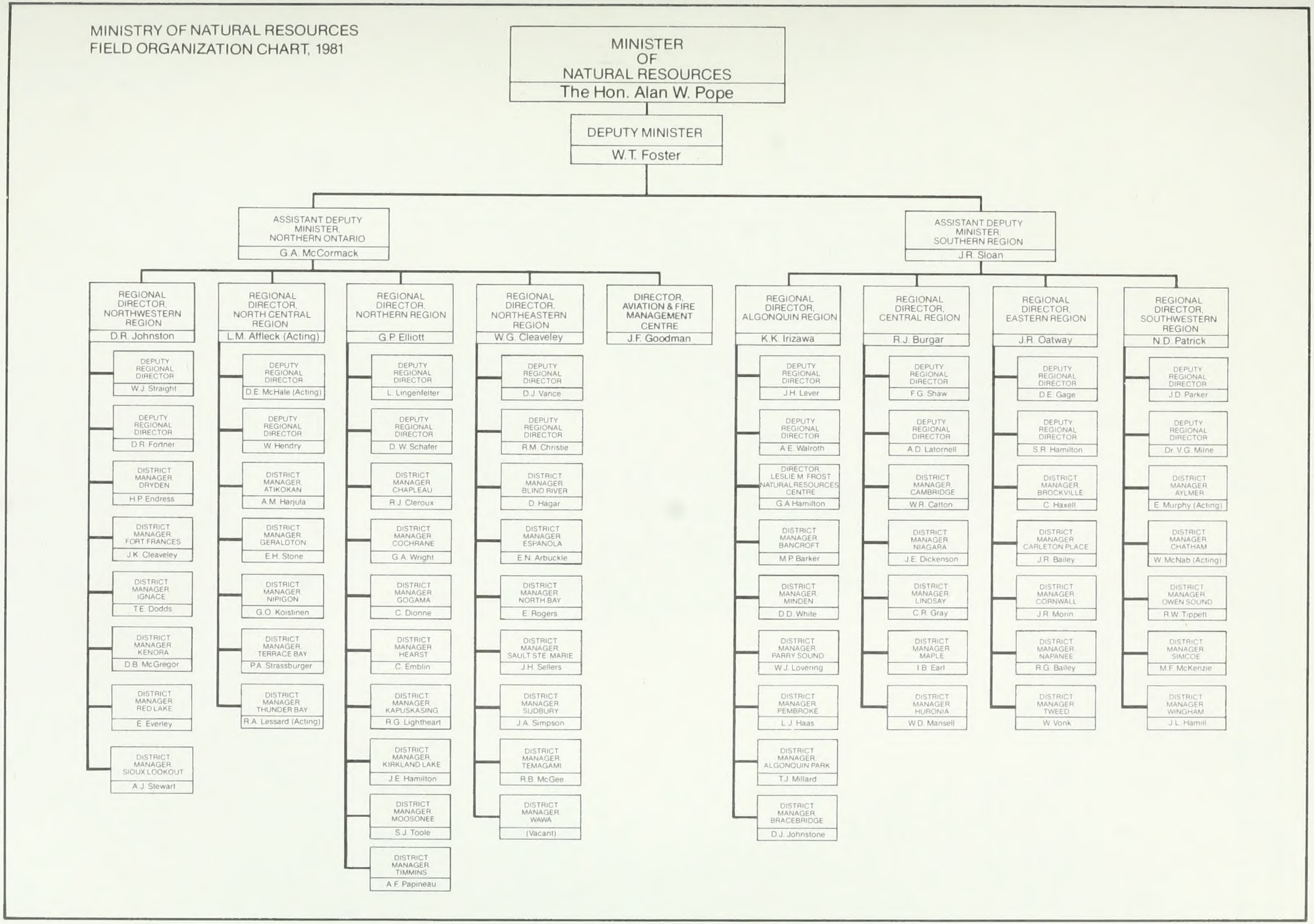
Ministry of Natural Resources Statement of Budgetary Expenditure for the Year Ended March 31, 1981

Ministry Administration Program	($thousands)	($thousands)
Main Office	3,878	
Financial Services	2,090	
Supply and Office Services	3,581	
Personnel Services	1,357	
Information Services	1,077	
Systems Development Services	76	
Legal Services	661	
Audit Services	611	
Field Administration	16,244	
Total for Ministry Administration		29,575
Land Management Program		
Water Control and Engineering	13,202	
Forest Protection	22,540	
Air Service	8,103	
Extra Firefighting	35,417	
Resource Access	4,435	
Land and Water Classification	8,431	
Land, Water and Mineral Title Administration	10,962	
Conservation Authorities	40,569	
Basic Mapping and Geographic Referencing	2,066	
Total for Land Management		145,725
Outdoor Recreation Program		
Recreational Areas	33,070	
Fish and Wildlife	32,616	
St. Lawrence Parks Commission	8,787	
Wasaga Park Community Project	6,547	
Total for Outdoor Recreation		81,020
Resource Products Program		
Mineral Management	12,268	
Forest Management	71,510	
Total for Resource Products		83,778
Resource Experience Program		
Junior Rangers	4,426	
Youth Corps (Experience '80)	3,766	
Leslie M. Frost Natural Resources Centre	1,185	
Total for Resource Experience		9,377
Total Budgetary Expenditure		349,475

MINISTRY OF NATURAL RESOURCES
ORGANIZATION CHART 1981



MINISTRY OF NATURAL RESOURCES FIELD ORGANIZATION CHART, 1981



Associated Agencies, Boards and Commissions

The Ministry of Natural Resources is associated with a number of agencies, boards, and commissions. Each of these associations is based on natural resources management, but the Ministry's relationship with particular groups can vary.

Some relationships are informal. The Ministry is Ontario's official natural resources manager, and often participates informally in the activities of other government and private agencies to promote co-operation in the field.

Other relationships are more direct, through the existence of administrative or financial links between different groups and the Ministry. Some of these related agencies produce a separate annual report outlining their activities. A list of these groups follows, and the reader should refer to the specific annual reports of the following for more information:

- Algonquin Forestry Authority
- Conservation Authorities (Ontario had 39 Authorities during 1980-81)
- Niagara Parks Commission
- St. Clair Parkway Commission
- St. Lawrence Parks Commission
- Provincial Parks Council
- Canada, Ontario, Rideau, Trent, Severn (CORTS) Advisory Committee

The following provides a brief description of the agencies, boards, and commissions that are either financially or administratively associated with the Ministry, and that produce no annual report.

Crown Timber Boards of Examiners

The Boards are made up of Ministry staff, and each year they set written and practical examinations in wood measurement. The Boards then recommend that successful examinees be issued with a Scaler's Licence by the Minister. During 1980-81, two Boards held two courses at Pembroke. Of 133 students examined, 113 successfully completed the examinations, and were recommended to receive a Scaler's Licence.

Game and Fish Hearing Board

The Board, comprised of not more than five members, who are appointed by the Lieutenant-Governor-in-Council, conducts hearings following the refusal by the Ministry of an application for a commercial hunting or fishing licence. The Board hears evidence, and delivers a written summary and recommendations to the Minister, who may or may not decide to issue the licence.

Geoscience Research Review Committee

The Committee was established in April, 1978, to advise the Minister on geoscience research priorities and the merit of research proposals which are submitted to the Geoscience Research Grant Program of the Ontario Geological Survey.

The 11-member committee is made up of representatives from industry, universities and government, and makes recommendations regarding research goals, provides peer review and recommends the awarding of grants to successful applicants. In the past year the program awarded 29 research grants totalling $499,600 to ten Ontario universities.

Ontario Geographic Names Board

The Board, which meets quarterly, has authority over Ontario's geographical names. Last year the Board approved 567 names. The names are disseminated to other agencies and become official for use on maps, charts, in gazetteers, property descriptions, and other documents. The Board makes decisions regarding contentious geographical names or those involving conflicts of interest.

Public Agricultural Lands Committee

Comprised of staff from the Ministry and the Ontario Ministry of Agriculture and Food, this committee reviews all applications for public lands required for agricultural purposes. During 1980-81, the committee dealt with 19 applications, most of which were from farmers wishing to enlarge their operations on Crown lands in northern and northwestern regions.

ISSN 0383-5901
5639